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Bibliography on Dew, p. 360

l. 3 April, 1952 No. 4

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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***EDITORIAL OFFICE:** Washington, D. C. **P.O. ADDRESS:** Box 1736, Washington 13, D. C. Telephone: REpublic 6278.

ADMINISTRATIVE OFFICE: American Meteorological Society, Office of Executive Secretary, 3 Joy Street, Boston 8, Mass.

* Address all business communications, orders and inquiries to the Executive Secretary, Mr. Kenneth C. Spengler, 3 Joy Street, Boston 8, Mass. Exchanges and reprints may be sent direct to P. O. Box 1736, Washington 13, D. C.

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY is a monthly publication devoted to:

A. Current Abstracts in English on important meteorological literature in every language.

B. Bibliographic references to other items of interest to the profession.

C. Selective, annotated bibliographies on subjects of immediate and special interest to meteorologists.

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 3 APRIL 1952 No. 4

SPECIAL FEATURE IN THIS ISSUE

A Selective Annotated Bibliography on Dew

(*For complete table of contents see back cover*)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains from 175 to 300 abstracts of current periodical literature and monographs in the fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 important references on a special subject without respect to recency of material. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject. Preference is given to recent material, comprehensive works, material from obscure sources, and items with good bibliographies.

Bibliographies previously published were:

No.	Mo.	Vol. I, 1950	Vol. II, 1951
1.	Jan.	**Atmospheric Pollution**	**Extended Forecasting**
2.	Feb.	**Aerobiology**	**Long Range Forecasting**
3.	March	**Cloud Physics and "Rain Making"**	**Soil Temperature**
4.	April	**Hail**	**Constants, Units, Tables and Diagrams**
5.	May	**Tornadoes**	**Climate of the Near East**
6.	June	**Volcanic Dust**	**Climate of the Middle East**
7.	July	**Climatic Changes**	**Special Winds**
8.	Aug.	**Thunderstorms**	**Radar Storm Detection**
9.	Sept.	**Icing**	**Condensation Trails**
10.	Oct.	**Acoustical Propagation**	**Climate of Northeast Africa**
11.	Nov.	**Evaporation**	**Mountain Meteorology**

Bibliographies published this year were:

1. **Climatology of Northwest Africa,** Vol. III, No. 1, Jan. 1952
2. **Carbon Dioxide,** Vol. III, No. 2, Feb. 1952
3. **Climate of Paraguay, Uruguay and Argentina,** Vol. III, No. 3, March 1952
4. **Dew,** Vol. III, No. 4, April 1952

Forthcoming bibliographies will be:

5. **Objective Forecasting,** Vol. III, No. 5, May 1952
6. **Stratus Forecasting,** Vol. III, No. 6, June 1952
7. **Urban Climatology,** Vol. III, No. 7, July 1952

Other bibliographies in preparation are:

Actinometers
Climate and Cancer
Climate of Central Africa
Climate of Southeast Asia and the East Indies
Frost and Frost Forecasting
Glazed Ice
Machine Methods in Meteorology
Microwave Propagation
Oceanographic Meteorology
Ozone
Tropopause Variations
Turbulence
Visibility

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the June and December issues cumulative indexes are published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorological Society) Library, Milton, Mass.
NN:	New York Public Library, New York, N. Y.
NNA:	American Geographical Society Library, New York, N. Y.

Additional library symbols used in this issue only:

NNC:	Columbia University Library, New York, N. Y.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example, Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol. 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

WORKS OF SPECIAL INTEREST

3.4–1 551.577 551.573

†*Albrecht, Fritz, **A. Monatskarten des Niederschlages im Indischen und Stillen Ozean. B. Monatskarten der Verdunstung und des Wasserhaushaltes des Indischen und Stillen Ozeans.** [A. Monthly precipitation charts for the Indian and Pacific Oceans. B. Monthly evaporation and water economy charts for the Indian and Pacific Oceans.] *Germany, Deutscher Wetterdienst in der US-Zone, Berichte*, No. 29, **1951.** 39 p. 16 figs., 2 tables, 44 refs. **MH-BH**—A. The monthly maps of precipitation in the Indian and Pacific Oceans are based upon: 1) SCHOTT's maps (1935) of precipitation amounts in the Indian and Pacific Oceans, corrected by the data on mean rainfall probabilities as given in "Atlas of climatic charts of the oceans" by W. F. MACDONALD and 2) mean monthly rainfall of 384 island and coastal stations and upon the charts of three month averages of rainfall frequency given in the "Atlas of climatic charts of the oceans." From these data the annual march of precipitation was determined over 13 areas, eleven of which coincided with meridians. The method of constructing the precipitation profiles and the rainfall charts, the rainfall characteristics of the island and coastal stations and precipitation maps for six months are given. The dependence of precipitation distribution upon the paths of atmospheric currents and upon the monsoon is shown. B. Using MACDONALD's "Atlas of climatic charts of the oceans" and data on monthly air and water temperatures and wind velocities over the oceans, the author calculated evaporation between 50°N. lat. and 45°S. lat. by means of SVERDRUP's formula. Evaporation on islands and on land adjoining the oceans was determined by a formula which relates evaporation to monthly means of saturation deficit and precipitation. The method of calculating evaporation charts is described and maps, showing evaporation and the difference between evaporation and precipitation for every second month, are given. A discussion of the water economy in the Indo-Pacific region and of the water cycle in the atmosphere is presented. *Subject Headings:* **1. Precipitation charts 2. Evaporation charts 3. Indian Ocean 4. Pacific Ocean.**—*I.L.D.*

3.4–2 551.577:551.573:551.464

Jacobs, Woodrow Cooper, **The energy exchange between sea and atmosphere and some of its consequences.** *California, University, Scripps Institution of Oceanography, Bulletin*, La Jolla, 6(2), **1951.** 122 p. charts, graphs, tables, biblio. Price $1.00. **DWB**—Continuing his work published in 1942 and 1943, the author has calculated the mean seasonal and annual evaporation, sensible heat loss and total heat loss from 5-degree squares of the sea surface for the North Atlantic and North Pacific. Of greater interest to meteorologists are his calculations of the mean seasonal and annual precipitation by 10-degree squares over all oceans. From the preceding data the author is able to present calculations of the seasonal and annual values of the total convective energy received by the atmosphere over the Northern Hemisphere oceans. By-products of the investigation are seasonal and annual charts of E-P and an annual chart of salinity advection for the North Pacific and North Atlantic. Results are presented in logical order, by means of tables, graphs, charts and block diagrams as well as in text. *Subject Headings:* **1. Hydrologic cycle 2. Energy exchange between sea and atmosphere 3. Evaporation from seas 4. Precipitation over oceans 5. North Atlantic 6. North Pacific.**—*M.R.*

3.4–3 551.591

Foitzik, Leonhard, **Über die Kontrastschwelle des Auges in Bezug auf das Lichtproblem; Beiträge zur definierten Bestimmung der Tagessichtweite.** [The contrast threshold of the eye in respect to the visibility problem; contributions to the accurate determination of daytime

visibility.] *Germany, Deutsche Demokratische Republik, Meteorologischer Dienst, Abhandlungen*, No. 8, **1951.** 74 p. tables, diagrs., graphs, refs. **MH-BH**—The author, who has been publishing valuable contributions to the knowledge of visibility factors since 1932, has in this monograph provided the most comprehensive treatment of the subject since MIDDLETON's famous text (2nd ed. 1941) appeared. The present work is based on a multitude of observations made of the visibility of numerous specific dark colored objects such as church spires, towers, triangulation points or chimneys which make an angle of $<1°$ with the eye. The objectives are grouped according to direction from observation point (Lindenberg) using 8 sectors of the compass, to distance (<100 m. to >50 km) and to whether the background is infinite, $>2\times$distance of objective, or $<2\times$distance of objective. In addition to the "Nadelziele," or pin point objectives, tabulated in the above fashion, there were numerous "Grossziele" or large objectives which could be seen with the eye and measured with a light meter. Observations were also tabulated according to time of day (08, 10, 12, 14, etc.) and according to observer (no significant difference in mean values of 4 observers). The relation between visibility s/N and the contrast threshold V and between the visibility of large and small objectives [plotted according to size (mean angle) vs. contrast threshold] is worked out in detail and discussed. The latter relationship is shown in comparison with curves made from data of SIEDENTOPF, SCHÖNWALD and SCHARONOW. Dependence of contrast limit on illumination (light intensity) is investigated by means of an illumination meter and the results tested in the laboratory. The contrast limits of trees (forest objectives) are next determined by means of numerous observations under different solar angles, cloudiness conditions and colors of objectives. Many other relationships are studied, the last being the contrast threshold of the eye for various shapes of objects as determined in the laboratory. The conclusion is that for isolated objects, it makes no difference what the shape is (only the size or area of the surface is significant), but for objects resting on a base, the contrast threshold is greater if a large base is used than for a small base, and in any case is greater than for free objects. Actual details of observations, made at 4 times of the day during Aug.–Nov. 1947, are given in the appendix. *Subject Headings:* **1. Visibility in daytime 2. Visibility measurement 3. Contrast threshold 4. Lindenberg, Germany.**—*M.R.*

3.4–4 551.58 551.5:92:016

†Voeĭkov, Aleksandr Ivanovich, **Izbrannye sochineniia,** [Selected works.] Moscow, Akademiia Nauk, **1948.** 750 p. 23 figs., port., numerous tables, biblio. p. 93–160, biographical data p. 83–90, appends. **MH-BH**—The first volume of the selected works of A. I. VOEĬKOV contains a comprehensive description and evaluation of the climatological ideas of VOEĬKOV by A. A. GRIGORIEV; a biography and a description of the scientific activities of VOEĬKOV by G. D. RIKHTER; a complete bibliography of VOEĬKOV's writings and the complete text, including the maps, of VOEĬKOV's classic book "Climates of the earth and especially of Russia," which first appeared in 1884 and which appeared in a revised and augmented edition in German in 1887. *Subject Headings:* **1. Climatology 2. Biography 3. Voeĭkov, Aleksandr Ivanovich 4. Bibliographies.**—*I.L.D.*

3.4–5 551.521.61

Kondrat'ev, K. IA., **Perenos dlinnovolnovogo izlucheniia v atmosfere.** [Transfer of long wave radiation in the atmosphere.] Moscow, Gosizdat., **1950.** 287 p. 47 figs., 26 tables, 71 refs., equations. **DLC**—A systematic presentation of many aspects of the problem of long wave radiation, absorption and transfer of energy in the atmosphere based on theory of a few non-Russian (ELSASSER, MÖLLER and others) and many native scientists (KUZNETSOV, KONDRAT'EV, KASTROV, EVFIMOV, KIBEL' and others). The five chapters (34 sections) take up: 1) absorption of long wave radiation (theory, measurement of spectral lines and bands, dependence of pressure and temperature, infrared absorption by water vapor, ozone, CO_2 and other atmospheric constituents, instrumental procedures, etc.); 2) general theory and laws of radiative transfer (heat exchange, monochromatic radiation, characteristics of Exponential integral (En) function, transfer of non-monochromatic radiation, diffuse radiative propagation); 3) approximate methods of calculating diffuse and direct radiation (by graphical and numerical methods) for different heights in the atmosphere, outgoing radiation; 4) effective radiation from the ground (empirical methods of calculation, errors in measurement and calculation,

theory, effect of inversion, cloudiness, spectral distribution of effective radiation and counter-radiation, geographical variations); 5) radiative heat exchange in atmosphere (relation to turbulent heat exchange, radiative balance, vertical temperature gradient). Working tables and nomograms are appended. *Subject Headings:* **1. Infrared radiation 2. Radiative transfer.** —*M.R.*

3.4–6 551.5:551.46(02)

*Kalle, Kurt, **Der Stoffhaushalt des Meeres.** [Chemical balance of the oceans.] 2nd ed. *Probleme der kosmischen Physik*, Vol. 23, **1945.** 263 p. charts, diagrams, tables, 420 refs. **MH-BH**—This treatise comprises the most thorough review of numerous phases of physical and chemical oceanography ever attempted. The first edition appeared in 1944 and this second edition, with very few changes, in 1945. The literature cited in the extensive bibliography covers most of the important articles in every language up to 1940 and 1941. In addition to the chapters on the chemical composition of the sea, there are chapters on the origin and extent of the oceans, the sources of energy and matter in the sea, the heat and mass balance between the sea and the atmosphere and between the sea and the continents, suspended and precipitating substances, gases and exchange of gaseous substances, bio-chemistry, currents, etc. Many special problems of interest to meteorologists are covered in a quantitative and technical manner, with results of analyses presented in numerous tables and graphs. *Subject Headings:* **1. Oceanography 2. Energy exchange between sea and atmosphere 3. Chemical oceanography 4. Textbooks 5. Bibliographies.**—*M.R.*

3.4–7 551.508.26:536.5

Lieneweg, Hermann Fritz, **Temperaturmessung.** [Temperature measurement.] Leipzig, Geest & Portig, **1950.** 219 p. diagrs., graphs, tables, refs. **DLC**—The volume is a comprehensive survey of the theoretical principles underlying the various methods of measuring temperature and of the apparatus most commonly used in science and industry. It consists of five sections, namely: 1) procedures for measuring temperature which includes a discussion of contact thermometers and the various types of radiation thermometers; 2) the chemical and mechanical requirements of thermometers; 3) the installation of the thermometer; 4) recording lag of the thermometer and 5) an appendix which includes a discussion of the procedure for compensating errors, and for calibrating resistance thermometers (100,000 ohm at 0°C) and thermal elements. The sources of error inherent in the various methods and apparatus are analyzed and their corrections are discussed. The mathematical treatment is fairly simple. Numerous diagrams of the apparatus giving details of their construction are included. *Subject Headings:* **1. Temperature measurement 2. Thermometers 3. Calibration of instruments.**—*I.L.D.*

3.4–8 551.5(02)

†Neuberger, Hans Hermann, **Introduction to physical meteorology.** State College, Pa., **1951.** 271 p. diagrs., photos, tables, graphs, refs. **DLC**—A delightful addition to the ever-growing library of works on meteorology intended for advanced students. Several phases of physical meteorology which are not usually covered in textbooks are treated thoroughly in this text. The outstanding omission is the entire field of dynamic meteorology, but this does not detract from the value of the work since it is the subject of so many textbooks already in common use. The six major parts comprise: 1) condensation (cloud physics, icing, aerosols, etc.); 2) visibility (physiological factors, attenuation, day time, night time and slant visibility); 3) radiation (solar, terrestrial, scattered—heat balance); 4) acoustics (Döppler effect, propagation in troposphere and stratosphere); 5) optics and 6) atmospheric electricity (ionization, lightning, aurora, spherics and radar in meteorology). The 6 appendices contain constants, conversion tables and equations for calculations in the several fields covered in the above chapters. Each chapter also contains numerous tables, graphs and nomograms as well as an ample list of references on works in that field (mostly to works in English and German). The text was compiled from the notes which the author used in his course at Pennsylvania State College, but is intended for use in extension courses for government meteorologists as well as in courses on the campus. *Subject Headings:* **1. Physical meteorology 2. Textbooks. I. Pennsylvania State College, School of Mineral Industries.**—*M.R.*

3.4–9 550.510.41:535.33(02)

†*Prokof'eva, I. A., **Atmosfernyĭ ozon.** [Atmospheric ozone.] Moscow, Akademiia Nauk, **1951.** 231 p. graphs, charts, diagrs., tables, 213 refs. Price 11 rubles, 50 kop. **DLC**—A systematically organized and technical monograph covering every aspect of: a) instrumentation, b) computation and c) interpretation of data on ozone in the atmosphere, based on work of Russian and foreign scientists from 1879 to 1950. The first chapter reviews the theory and history of research on spectral absorption by ozone (in the UV—visible and infrared bands), the influence of temperature and pressure on coefficient of absorption, the structure of the ozone molecule, oxygen absorption and the distribution of energy in the UV portion of the solar spectrum. The second chapter covers all of the known methods of measurement of atmospheric ozone (including the spectrograph, spectrophotometer, filter and integrating photometers); methods of determination of ozone by observation of direct sun's rays, from zenith sky observations in clear and cloudy weather, moonlight, starlight, influence of aerosols; measurement of surface ozone by optical, chemical and fluorescent means; methods of determining thickness, temperature and vertical distribution of ozone layer. Chapter III gives summaries of observational data, analyzed according to diurnal, seasonal and non-periodic (relation to thunderstorms, fronts, air masses, weather, etc.) and magnetic or solar activity. The final chapter is devoted to theoretical discussion of the causes of the vertical distribution, turbulent and molecular diffusion, the diurnal and annual periodic and the nonperiodic variations of ozone in the ozonosphere and at the surface. An unusual amount of quantitative data is presented in tabular and graphic form and the bibliography of 213 items (of which 58 are in Russian) covers most of the important literature up to 1949. *Subject Headings:* **1. Ozone 2. Ozonometers 3. Spectroscopy 4. Textbooks.**—*M.R.*

GENERAL METEOROLOGY

(*See also items:* 3.4–4, 3.4–6, 3.4–8)

3.4–10 551.5:06(09)(493)

Dufour, L., **Sketch history of meteorology in Belgium.** *Weather*, 6(12):359–364, Dec. **1951.** 5 photos, 3 refs. **MH-BH**—After the "Scholastic period," experimental meteorology began in 16th century. First observations in 18th century developed under QUETELET after 1850 into real climatology. Official forecasting began 1876, aerology 1906, extended by JAUMOTTE to aid 3-dimensional study of cyclones. Portraits of B. FROIDMONT (1587–1653), TH. MANN (1735–1809), F. VAN RYSSELBERGHE (1846–1893), J. JAUMOTTE (1887–1940) and A. QUETELET (1796–1874). *Subject Headings:* **1. History of meteorology 2. Meteorological services 3. Belgium.**—*C.E.P.B.*

3.4–11 551.5:06:92

Gregor, Alois, **Ředitel čínské lidově demokratické meteorologické služby v Praze.** [The director of the Chinese Popular Democratic Meteorological Service in Prague.] *Meteorologické Zprávy*, 4(5–6):126, **1950.** photo. In Czech. **MH-BH**—Brief note on the visit of DR. CHANG-WANG TU who stopped at Prague in November 1950 on his way to Warsaw as a member of the Chinese delegation to the peace conference there. A photograph shows DR. GREGOR and CHANG WANG TU. *Subject Headings:* **1. Meteorologists 2. Photographs of meteorologists 3. Directors of services. I. China (Peoples Republic of China, 1949) Meteorological Service II. Tu, Chang-wang.**—*G.T.*

3.4–12 551.5:06:92

India. Meteorological Department, **Report on the administration of the Meteorological Department of the Government of India in 1949–50.** Simla, Govt. Press, **1951.** 62 p. 8 plates, tables, refs. **DWB**—Biographical note on DR. S. K. BANERJI who retired on April 27, 1950 as director, Detailed reports on activities of various departments and projects. Ships which reported during year, principle events of year, disasters, publications of the Department and of members of the Department are listed. *Subject Headings:* **1. Meteorological services 2. Biography 3. Banerji, S. K. 4. Marine meteorological data 5. India.**—*M.R.*

3.4–13 551.5:06 550.46:06

International Union of Geodesy and Geophysics. 9th. General Assembly, Brussels, 20 August to 1 September 1951. *Weather*, 6(12):373–375, Dec. **1951. MH-BH**—Summaries of proceedings of Associations of Meteorology, Physical Oceanography and Hydrology (Commission of Snow and Ice). *Subject Heading:* **1. International Union of Geodesy and Geophysics.**

3.4–14 551.5:06(09)

Marshak, Il'ia IAkovlevich, (Mikhail Il'in, *pseud.*) **Chovek"t sreshchu stikhiite.** [Man among the elements.] Sofia, ORPS, **1948.** 152 p. Translation by Maria Dramalieva of chapters 1–5 of author's **Chelovek i stikhiia** from Russian into Bulgarian (without original illustrative material). **DLC**—The history of meteorological observations, synoptic and marine meteorology written in the language of the layman. Although mention is made of the important figures in meteorological history who lived in England, Germany, Italy, etc., the main emphasis is on the contributions made by the great Russian meteorologists and on the organization for storm warnings, aviation forecasts and hydrometeorological service in Russia before and after the revolution. (*See also* item No. 3.4–43 below.) *Subject Headings:* **1. History of meteorology 2. Popular meteorology 3. Bulgarian language. I. Dramalieva, Maria** (*trans.*).—*M.R.*

3.4–15 551.5:06(47)

Marshak, Il'ia IAkovlevich, (Mikhail Il'in, *pseud.*) **Ukrotiavane na stikhiite.** [Modifying (moderating) the elements.] Sofia, ORPS, **1948.** 135 p. Translation by Maria Dramalieva of chapters 10–12 of author's **Chelovek i stikhiia** from Russian into Bulgarian (without original illustrative material). **DLC**—The development of the research and public service activities of the Hydrometeorological Service of the U.S.S.R. is outlined in this popular edition. Of special interest is the mention of work in dynamic meteorology and single station forecasting by Prof. Kibel', of the work of the flood and ice forecasting services, the hydrographic and oceanographic institutes, the climatological service and efforts at climatic amelioration or control of nature and of service rendered by meteorologists in wartime. *Subject Headings:* **1. Meteorological services 2. Meteorological research 3. Bulgarian language 4. U.S.S.R. I. Dramalieva, Maria** (*trans.*).—*M.R.*

3.4–16 551.5:06

Meteorology at the British Association meeting in Edinburgh, August 1951. *Weather*, 6(11):338–339, Nov. **1951. MH-BH**—Brief summaries of papers by J. Paton (Luminous night clouds), R. F. Jones (Radar echoes from precipitation), A. W. Brewer and I. C. Browne, and discussion on natural and artificial production of atmospheric precipitation. *Subject Headings:* **1. Conferences 2. Luminescent clouds 3. Radar precipitation echoes 4. Artificial precipitation.**—*C.E.P.B.*

3.4–17 551.5:06

Umluva o světové meteorologické organisaci. [Agreement on the World Meteorological Organization.] *Meteorologické Zprávy*, 4(5–6):126–127, **1950.** In Czech. **MH-BH**—Report on the World Meteorological Organization—its purpose, set-up, laws, executive bodies and committees. A list of 45 member states who had been represented at the conference in Washington is added. *Subject Headings:* **1. World Meteorological Organization 2. Meteorological services.**—*G.T.*

3.4–18 551.5:37:629.13

Crossley, A. F., **Meteorological examinations for civil pilots and navigators.** *Meteorological Magazine*, London, 80(953):318–323, Nov. **1951. MH-BH**—Describes various types of pilot's licences and the technical examinations involved, with special reference to meteorology. Two specimen meteorological question papers are included. *Subject Heading:* **1. Meteorological examinations.**—*C.E.P.B.*

3.4–19 551.5:629

Henley, E. D., **Weather and the carriage of freight by rail in Britain.** *Weather*, 6(8):233–236, Aug. **1951.** 2 photos. **DWB**—Brief account of cooling in summer by ventilation or insulation (with or without refrigeration) and protection from cold and excess humidity in winter. *Subject Headings:* **1. Applied meteorology 2. Insulation 3. Transport facilities.**—*C.E.P.B.*

3.4–20 551.5:629.12

Moore, J. D. D. and Thomas, A. V., **Surface navigation in high latitudes.** *Institute of Navigation, Journal*, London, 4(2):126–135, April **1951.** table, 12 refs. **DWB**—Problems discussed are: difficulty of determining position precisely by compass or astronomical means—errors due to refraction (mirage), fog, magnetic disturbances, etc. Radar or microwave techniques for determining positions along coast lines explained. Effect of icebergs mentioned. Few navigational aids or good navigating charts exist in this region. Climatic conditions also uncertain. *Subject Headings:* **1. Arctic navigation 2. Marine meteorology 3. Radar observation 4. Navigational aids.**—*M.R.*

3.4–21 551.5:91:551.46(02)

Lake, Philip, **Physical geography.** 2nd ed. rev. and enl. by J. A. Steers, G. Manley and W. V. Lewis. Cambridge [Eng.] University Press, **1949.** 410 p. charts, diagrs., photos, tables, biblio. **DLC**—The first edition of this classic appeared in 1915 and many reprints have been made since then, but this is the first complete revision, including a long section (137 p.) on the atmosphere by Gordon Manley, wherein the elementary concepts of meteorology (pressure, general circulation, winds, isobars, cyclonic and anticyclonic disturbances, temperature and radiation measurements and variations on the earth and in the free atmosphere, humidity, precipitation, fronts and air mass characteristics) are discussed. Excellent photographs, charts, synoptic maps and schematic diagrams are included. A shorter section on the oceans, waves, tides, currents, etc. follows the section on the atmosphere. *Subject Headings:* **1. Meteorology 2. Oceanography 3. Textbooks. I. Steers, J. A., (*ed.*) II. Manley, Gordon, (*ed.*) III. Lewis, W. V., (*ed.*).**—*M.R.*

3.4–22 551.5:92

Fikar, J., **40 let dobrovolného pozorováni na meteorologické stanici.** [Forty years of voluntary observation at a meteorological station.] *Meteorologické Zprávy*, 4(5/6):132, **1950.** photo. In Czech. **MH-BH**—Note on František Hofmeistr who died on July 8, 1950 after 40 years of continuous observation and educational work and is described as one of the most conscientious collaborators of the Czechoslovak meteorological service. His portrait is presented. *Subject Headings:* **1. Obituaries 2. Cooperative observers 3. Hofmeistr, František 4. Czechoslovakia.**—*G.T.*

3.4–23 551.5:92

Hagihara, Y., **Prof. Rikiti Sekiguti.** *Nature*, London, 168(4286):1065, Dec. 22, **1951. DLC**—Meteorologist and astronomer, graduated from University of Tokyo 1907. Died Aug. 10, 1951. Professor of astrophysics at University of Tokyo 1936–1946. Applied Margules' theory to solar atmosphere. Wrote (in Japanese) "The Sun," "Astrophysics," etc. *Subject Headings:* **1. Biography 2. Sekiguti, Rikiti.**—*C.E.P.B.*

3.4–24 551.5:92:581.543

Kurc, J., **Památce ředitele Josefa Švábenského.** [Obituary of director Josef Švábenský.] *Meteorologické Zprávy*, 4(5/6):132, **1950.** photo. In Czech. **MH-BH**—Acknowledgment of the phenological observation work done by high school director Josef Švábenský. Reference is made to one publication and an unpublished microclimatological work prepared by him. His portrait is attached. *Subject Headings:* **1. Obituaries 2. Phenology 3. Švábenský, Josef.**—*G.T.*

3.4–25 551.5:92

Votrubec, Ct., **Za profesorem Dr. V. J. Novákem.** [Obituary of professor Dr. V. J. Novák.] *Meteorologické Zprávy*, 4(5/6):132, **1950.** photo. In Czech. **MH-BH**—A brief article dedicated to the life and work of Dr. V. J. Novák, professor of geography at the Prague University. The scientist's climatological publications are listed and his photo reproduced. *Subject Headings:* **1. Obituaries. I. Novák, V. J.**—*G.T.*

3.4–26 551.5:629.13(04)

Watson-Watt, Sir Robert, **Meteorology and aviation.** *Royal Meteorological Society, Quarterly Journal*, 77(334):552–568, Oct. **1951. MH-BH**—A history of British AIRMET

broadcasts and their cessation, and the case for resumption. Also a history of the transfer of the (British) Meteorological Committee to the Air Ministry, the amalgamation of the four meteorological services existing in 1919, and some discussion of policy including a public enquiry aided by the Royal Meteorological Society into the best attainable organization of a State Meteorological Service. *Subject Headings:* **1. Meteorological services 2. Weather broadcasting 3. Aeronautical meteorology.**—*C.E.P.B.*

3.4–27 551.5(05)

†**Weather Development and Research Bulletin; Index to No. 1–17, April 1945–Aug. 1951.** *Weather Development and Research Bulletin*, Melbourne, No. 17:49–58, Aug. **1951. DWB**—Seventy-seven articles, which have been published in this Bulletin since the first issue in 1945, are listed alphabetically by author and title with the U.D.C. subject classification number or numbers and the issue, month, year and pagination. The format of the *Bulletin* is to be changed with the next issue, so that it will appear as a regular journal from now on. *Subject Headings:* **1. Periodical indexes 2. Bibliographies.**—*M.R.*

3.4–28 551.5(09)

†Flohn, Hermann, **Ergebnisse und Probleme der Meteorologie 1940 bis 1950.** [Results and problems of meteorology 1940–1950.] *Naturwissenschaftliche Rundschau*, 4(5):201–210, May **1951.** 4 figs., table, 37 refs. **DWB**—An excellent summary of the literature under the headings: aerology and synoptics (mainly 3-dimensional), general circulation of the atmosphere, theoretical meteorology (developments of mathematical analysis of 3-dimensional motion on a rotating sphere) and experimental meteorology (from microclimatology to the ionosphere, solar physics, radiation). Includes a discussion of relation of daily thunderstorm frequency in Europe to passage of large sunspots. *Subject Heading:* **1. History of meteorology.**—*C.E.P.B.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

(*See also items:* 3.4–203, 3.4–218)

3.4–29 551.501:551.582.2(798)

Dale, Robert F., **Alaska cooperative weather observer.** *Alaskan Agriculturist*, 3(2):20 22, June **1951.** graph. **DWB**—Synoptic reporting network in Alaska is described, and the cooperative observer network and its purpose are outlined. A series of frequency curves are presented, which show chances of spells of dry weather of 3, 5 or more days in June October based on 31 years of record at Palmer, Alaska, as an example of the possible uses of such data as are collected daily by 34 unpaid cooperative observers of Alaska. Names of observers at each station are listed, one with 20 years of service. *Subject Headings:* **1. Cooperative observers 2. Meteorological networks 3. U. S. Weather Bureau 4. Alaska.**—*M.R.*

3.4–30 551.501(09):551.506.3(437)

*Petrovič, Štefan, **Štátne meteorologické a geofyzikálne observatorium v Hurbanove (Stará Ďala) päťdesiatročné.** [The National Meteorological and Geophysical Observatory at Hurbanovo (Stará Ďala) has been in action for fifty years.] *Meteorologické Zprávy*, 4(5-6): 100–103, **1950.** 2 figs., 3 refs., table, photo attached. In Slovak. **MH-BH**—It is pointed out that Dr. Miklos Konkoly Thege, Sr., founded a private meteorological station on his estate as early as 1867 and in 1890 this became a national observation station which was transferred to a new building in 1900. The station is said to be practically the only one in Slovakia with continuous records for the last 50 years. In addition to regular work, special research was carried on, such as actinometric measurements, measurement of evaporation and depth of freezing in the soil. Tables showing mean values of climatic elements are presented with various comments including the statement that the 10-yearly means show a rise of 0.8°C. in annual mean temperature during the last 70 years. *Subject Headings:* **1. Meteorological observatories 2. Long period records 3. Slovak language 4. History of meteorology 5. Hurbanovo, Slovakia.**—*G.T.*

3.4–31 551.501.4:551.521

Czepa, O., **Über die Energieleitung durch langwellige Strahlung in der bodennahen Luftschicht.** [On the conduction of energy by long wave radiation in the air layer near the ground.] *Zeitschrift für Meteorologie*, 5(10):292–300, Oct. **1951.** fig., 3 tables, 12 refs., 19 equations. **MH-BH**—Tables, based on data by SCHNAIDT and ROBINSON, are given for transparency of the atmosphere with different amounts of water vapor and CO_2, total black body radiation -70 to $+50°C$, and radiation cooling of lower atmosphere by a cold surface in % of temperature difference. An example from Tulln, Lower Austria, of energy transport by long wave radiation from superheated ground to an overlying air mass with an adiabatic gradient, is worked out. *Subject Headings:* **1. Terrestrial radiation 2. Atmospheric absorption.** —*C.E.P.B.*

3.4–32 551.501.4:551.577.37

*U. S. Weather Bureau, Cooperative Studies Section, **Maximum possible rainstorm, Swan Lake Basin, Revillagigedo Island, Alaska.** *U. S. Weather Bureau, Cooperative Studies Section, Report* No. 10, Dec. **1949.** 10 p. 6 figs., 2 tables, 2 refs. **DWB**—As very little actual data exists for calculating depth-duration or possible maximum rainfall intensities in this remote region, maximum rainfall data for stations in similar topographic and meteorological location on the coasts of Washington, British Columbia and Alaska (stations having >50 inches precipitation per year) were used to calculate the maximum 10 year storm, maximum possible 24 hour precipitation and the seasonal variations in these parameters. Then by using a "slope index," the above data were applied to the actual basin and charts drawn of the parameters which, when integrated for the area, yielded the orthodox curves used by engineers in other areas. *Subject Headings:* **1. Maximum precipitation 2. Rainfall depth duration studies 3. Swan Lake Basin, Revillagigedo Island 4. Alaska.**—*M.R.*

3.4–33 551.501.4:517.2

Rees, Mina, **U. S. computing machine program.** *Science*, 112(2921):731–736, Dec. 22, **1950. DWB**—The use of analog computers, digital machines and other types of supernumerical calculators by government agencies and research institutions in the United States is surveyed. Various machines of several companies are mentioned (Seac, Swac, Edva, Binac, Univac, Anacom, etc.). *Subject Heading:* **1. Computing machines.**—*M.R.*

3.4–34 551.501.42:551.577.2(411)

Watson, R. A., **Variability of percentage annual rainfall over short distances in Scotland.** *Meteorological Magazine*, London, 80(949):189–190, July **1951.** table. **DWB**—Gives standard deviations of annual rainfall at 8 pairs of stations 3–16 miles apart, standard deviations of differences and correlation coefficients. At most places the standard deviations of differences were around 7%. *Subject Headings:* **1. Annual rainfall variations 2. Correlation coefficient 3. Scotland.**—*C.E.P.B.*

3.4–35 551.501.45:621.317.7

Kassander, A. R., Jr. and Stebbins, D. W., **The application of electrical counting to the compilation of frequency distributions and correlation tables.** *American Geophysical Union, Transactions*, 32(3):341–346, June **1951.** 6 figs., table, refs. **DWB**—An elaborate electrical-mechanical tabulator was devised at Iowa State College, which delivers the data in array form at the conclusion of a test. The instrument and wiring diagram are shown in illustrations. Methods of operation are described for specific applications. Other applications suggested such as nine class frequency distribution for one variable, a twenty-five cell correlation diagram for two variables, or six tetrachoric correlation diagrams for four variables. *Subject Headings:* **1. Machine methods 2. Tabulators 3. Computing machines.**—*M.R.*

3.4–36 551.501.45:551.513.1

Watanabe, T., **Table of $V_\theta = \lambda/2r(a^2 - r^2)$ and its application.** *Journal of Meteorological Research*, Tokyo, 3(11):379–385, Sept. **1951.** 2 figs., 2 tables, equations. In Japanese, English summary p. (23). **MH-BH**—Tables are given for calculating potential velocity in any latitude of a particle starting from rest on the equator and conserving its absolute angular

momentum. A slide rule and nomogram are illustrated for calculating dynamic pressure from density and velocity. *Subject Headings:* **1. Computation tables 2. Planetary circulation.**—*C.E.P.B.*

3.4–37 551.501.7:551.557.2

Hutchings, J. W. and Sawyer, J. S., **A note on the distribution of free-air wind vectors about their mean.** *Royal Meteorological Society, Quarterly Journal*, 78(335):105–106, Jan. 1952. **DWB**—Hutchings, referring to item abstracted as No. 10–117 in *Meteorological Abstracts*, Oct. 1950, queries assumption that individual wind vectors are distributed normally about their mean. Sawyer replies that the model adopted was adequate. *Subject Heading:* **1. Wind computation.**—*C.E.P.B.*

3.4–38 551.501.7:629.135.1

Ludlam, F. H., **A meteorological investigation using gliders.** *Weather*, 6(11):345, Nov. 1951. photo. **MH-BH**—Describes a method of measuring the pressure field round a hill by glider in radiocommunication with two ground stations with theodolites. *Subject Headings:* **1. Pressure fields 2. Gliders.**—*C.E.P.B.*

3.4–39 551.501.7

Roth-Desmeules, Ernst, **Zur Berechnung der Flugbahnscharen ferngesteuerter Raketen.** [On the calculation of the flight path parameters of guided missiles.] *Zeitschrift für angewandte Mathematik und Physik*, Basel, 2(6):487–489, 1951. fig., 7 equations. English summary p. 489. **MH-BH**—Equations are developed for the motion of a rocket steered by a wireless beam, involving thrust, air resistance, steering power and weight. *Subject Headings:* **1. Equations of motion 2. Rockets.**—*C.E.P.B.*

3.4–40 551.501.8

Maidens, A. L., **An automatic selecting device for "sferic" observations.** *Meteorological Magazine*, London, 80(952):281–282, Oct. 1951. **MH-BH**—Briefly describes an equipment to make a random selection of sferic signals exceeding a limiting value, and to give an audible warning so that the bearings can be read, transmitted and recorded. *Subject Heading:* **1. Sferics.**—*C.E.P.B.*

3.4–41 551.501.9

Crawford, A. B., **Establishment of the South African meteorological station on Marion Island, 1947–48.** *Polar Record*, 5(40):576–579, July 1950. 2 photos, 2 refs. **MH-BH**—An account of the annexation of the Prince Edward Islands by the Union of South Africa and the subsequent establishment of a meteorological station on Marion Island, early in Jan. 1948. The author, who was transferred from Tristan da Cunha to head the project, describes the difficulties in building operations, meteorological and astronomical observations carried out, survey work done and wild life observed. *Subject Headings:* **1. Meteorological stations 2. Marion Island, Indian Ocean.**—*M.L.R.*

3.4–42 551.501.9

Establishment of joint Canadian–United States meteorological stations in the Canadian Arctic, 1947–49. *Polar Record*, 5(40):602–605, July 1950. map. **MH-BH**—Expeditions by air and sea in 1947 and 1948 resulted in the establishment of the following stations in the Canadian Arctic: 1) Eureka, Ellesmere Island; 2) Resolute, Cornwallis Island; 3) Mould Bay, Prince Patrick Island and 4) Isachsen, Isachsen Island. An automatic station was established at Dundas Harbor in 1947. An attempt in 1949 to establish a fifth station near Cape Sheridan failed. The author relates some of the interesting incidents of several expeditions. *Subject Headings:* **1. Meteorological stations 2. Canadian Arctic.**—*M.L.R.*

3.4–43 551.501.9

Marshak, Il'ia IAkovlevich, (Mikhail Il'in, *pseud.*) **S khiliadi ochi k"m uremeto.** [A thousand eyes on the weather.] Sofia, ORPS, 1948. 141 p. Translation by Maria Dramalieva of chapters 6–9 of author's **Chelovek i stikhiia** from Russian into Bulgarian (without original illustrative material). **DLC**—A popular work describing the purpose of meteorological

observations and the organization of observational networks, especially in the U.S.S.R. Air masses, fronts, effects of continents and oceans, snowstorms or blizzards, storms at sea, construction of synoptic charts and various phases of the activities of the hydrometeorological service of the U.S.S.R. are described. Not only the fact that observations are made at 7000 stations and posts in the U.S.S.R. (the thousand eyes on the weather), but the use of automatic stations (Robinson—automat) during the war in the Arctic, Siberia and near Moscow is described. The basic principles of solar or cosmic influences on the weather as modified by varying conditions in the upper and lower atmosphere are also outlined. (*See also* items No. 3.4–14 and 3.4–15 above.) *Subject Headings:* **1. Meteorological elements 2. Observational networks 3. Automatic weather stations 4. Bulgarian language 5. U.S.S.R. I. Dramalieva, Maria (*trans.*).**—*M.R.*

OBSERVATIONAL DATA

(*See also items:* 3.4–30, 3.4–199)

3.4–44 551.506.1(71)

*British Columbia. Dept. of Agriculture, **Climate of British Columbia; tables of temperature, precipitation, and sunshine. Report for 1949.** Victoria, B. C., 1950. 26 p. entirely tables. **DWB**—Four tables present the following data for 1949: 1) monthly mean temperatures for the current period and the period of record for 132 stations; 2) monthly precipitation, average precipitation for the period for 135 stations; 3) monthly hours of bright sunshine, averages for period and altitude for 16 stations and 4) monthly maximum and minimum temperature for 120 stations. *Subject Headings:* **1. Observational data 2. Weather reports 3. British Columbia, Canada. I. Victoria, British Columbia. Gonzalez Observatory.**—*M.L.R.*

3.4–45 551.506.1

Jones, Sir Harold Spencer, **The demise of the annual Greenwich Meteorological Report.** *Royal Meteorological Society, Quarterly Journal,* 77(334):672–673, Oct. 1951. **MH-BH**—Owing to transfer of Greenwich Observatory to Herstmonceaux, the meteorological observations at Greenwich which began in 1841 are ceasing. The reports published annually in the Quarterly Journal since 1871 cease. *Subject Headings:* **1. Greenwich Observatory 2. Annual reports.**—*C.E.P.B.*

3.4–46 551.506.1(78):551.573:551.508.72

*Long, Arthur R. (*comp.*), **Evaporation; New Mexico and contiguous areas.** U. S. Weather Bureau, Albuquerque, New Mexico [1948]. 37+p. chiefly tables. **DWB** Factors affecting evaporation are enumerated: temperature, wind movement, relative humidity of air, salinity, nature of surface, barometric pressure, aspect or exposure, and finally, type of equipment (evaporating pan, reservoirs, etc.). Locations of stations in and near New Mexico are shown on chart. Describes type of equipment in general use by U. S. Weather Bureau. Data are presented *in extenso* for 26 stations in New Mexico and 14 in Arizona, Colorado and Texas. Monthly and annual averages or totals since as early as 1914 up to 1947 are included. *Subject Headings:* **1. Evaporation data 2. Evaporation measurement 3. New Mexico. I. U. S. Weather Bureau.**—*M.R.*

3.4–47 551.506.1(492)

Netherlands. (K.) Meteorologisch Instituut, **Jaarboek, 1948. A. Meteorologie.** No. 97, 1950. 94 p. chiefly tables. **DWB**—The annual report of meteorological statistics for the Netherlands contains the following: a list of all weather stations, data on the daily and monthly march of all the meteorological variables at the most important weather stations and a record of annual precipitation at all the weather stations in the Netherlands. *Subject Headings:* **1. Observational data 2. Annual reports 3. Netherlands.**—*I.L.D.*

3.4–48 551.506.1(914)

*Philippines. Weather Bureau, **Quarterly Climatological Review.** 1(1), Jan./March 1949. Manila, Weather Bureau Press, Feb. 1950. 87 p. tables. Mimeographed. **DWB**—Temperature and rainfall data for the first quarter of 1949 are given. The temperature data

are: monthly means, monthly extremes and daily maximum and minimum values. The rainfall data consist of monthly totals, maximum rainfall in 24 hours and days with rainfall. Also normal values of temperature and rainfall for each station are given. A general summary of weather conditions in the Philippines for the quarter and a list of weather stations are included. *Subject Headings:* **1. Climatic data 2. Philippines.**—*I.L.D.*

3.4–49 551.506.1(469)

*Portugal. Serviço Meteorológico Nacional, **Anuário climatológico de Portugal, II Parte, Territórios Ultramarinos, Vol. 1, 1947.** [Climatological annual, Part II, Overseas Territories, Vol. 1, 1947.] Lisbon, 1951. all tables. **DWB, DLC**—The Anais Meteorológicos das Colónias were published by the Direcção Geral de Fomento Colonial de Portugal through Vol. 31. The title was continued by the Serviço Meteorológico Nacional de Portugal in Vol. 32–33, 1945–1946 and published in 1951 when this *Anuário Climatológico de Portugal, II Parte, Territórios Ultramarinos* was issued. The Anuário Climatológico de Portugal, II Parte, Territórios Ultramarinos contains an introduction in which the details of the observations are described and the symbols used are listed. Thrice-daily (9 hr, 15 hr and 21 hr) observations of pressure, temperature, relative humidity, wind direction and velocity, visibility and cloudiness and daily observations of insolation, state of the sun, precipitation and evaporation for 44 meteorological stations in the Cape Verde Islands, Angola, Mozambique, Macao, Portuguese Guinea, India and São Tomé are presented. In addition, there are tables of monthly and annual precipitation for 72 rain gage stations. *Subject Headings:* **1. Observational data 2. Annual reports 3. Portuguese Colonies.**—*M.L.R.*

3.4–50 551.506.1:551.582.2(93)

*§U. S. Weather Bureau, **Climatological Data, National Summary.** Vol. 1, No. 1. Washington, D. C., Jan. 1950. 24+p. charts, chiefly tables. Latest issue received: Vol. 1, No. 11, Nov. 1950, **DWB** In addition to the usual climatological summary, includes heating degree days, records of severe storms and their damage, river and flood conditions and flood losses. Upper air data (radiosonde, pilot balloon, rawin) are tabulated as monthly averages and solar radiation data given daily. Charts include temperature, winds, pressure, sunshine, precipitation, tracks of highs and lows and mean charts for 850 to 300 mb levels. "Climatological Data, National Summary" is found bound at the end of each number of "Climatological Data" (for the "United States by Sections"), beginning with Vol. 37, No. 1, January 1950. *Subject Headings:* **1. Climatic data 2. Upper air data 3. Solar radiation data 4. United States.**—*C.E.P.B.*

3.4–51 551.506.5:551.481.1(94)

Bonython, C. Warren, **The evaporating waters of Lake Eyre.** *Weather*, 6(10):310–314, Oct. 1951. 2 photos. 4 refs. **DWB** —Account of an expedition in May 1951 to investigate evaporation from Lake Eyre, reformed for the first time for 30 years in 1949–1950. Temporary stations were set up on shore and in lake. *Subject Headings:* **1. Expeditions 2. Evaporation 3. Lake Eyre, Australia.**—*C.E.P.B.*

3.4–52 551.506.8

Hentschel, Gerhard, **Ein Beitrag zur Phänologie der Schneeglöckenblüte.** [A contribution to the phenology of the snowdrop.] *Angewandte Meteorologie*, Berlin, 1(2):43–53, Sept. 1951. 7 figs., 4 tables, 5 refs. **MH-BH**—Flowering of the snowdrop represents development of a definite combination of climatic conditions important also for other plants, e.g., gooseberry. Date of blooming at Wernigerode is compared with accumulated temperature above 0°C from Jan. 1, from last definite period of frost and from disappearance of continuous snow cover. The accumulated temperature since last frost period and number of days from end of snow cover gave best representation and lead back to specific singularities. *Subject Heading:* **1. Phenology.**—*C.E.P.B.*

3.4–53 551.506.8(09)

Morgen, Alois, **Beiträge zur Geschichte der Phänologie zum zweihundertsten Jahr ihrer Begründung.** [Contributions to the history of phenology on the 200th year of its beginning.] *Angewandte Meteorologie*, Berlin, 1(2):36–43, Sept. 1951. 2 figs., 13 refs. **MH-BH**—In 1751

Linnaeus' "Philosophia Botanica" included the first phenological calendar. Observations began in Finland same year, by Palatine Meteorological Society in 1781, Belgium in 1841, etc. Recounts history of German phenological network, reaching 6000 reporters in 1937, and the reason why few of these are meteorologists. Describes part played by agricultural schools, with specimen reporting form. *Subject Headings:* **1. Phenology 2. History of meteorology.**—*C.E.P.B.*

3.4–54 551.506.8 551.586:63

***Observaciones meteoro-fenológicas en España; año agrícola 1943.** [Meteorological—phenological observation in Spain; agricultural year 1943.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. D, Estadisticas*, No. 2, **1944.** 95 p. figs., tables. **Observaciones meteoro-fenológicas en España.** *Ibid.*, No. 4, **1948.** 99 p. chiefly figs. and tables. **DWB**—For each year (1943, 1944 . . .) the phenological stations in each province of Spain are listed, the observer, coordinates and elevation of the station, given. Charts (some colored) of isophenes of flowering of almond, pear, wheat, etc.; areas affected by disasters and pests; isanomalies of rain; duration of freezing temperatures and of high temperatures and seasonal values of sunshine duration. Data also given in tabular form. *Subject Headings:* **1. Phenology 2. Agricultural meteorology 3. Spain. I. Spain. Servicio Meteorológico Nacional.**—*M.R.*

3.4–55 551.506.8:551.586:63

Schnelle, Fritz, **Methoden und Möglichkeiten einer phänologischen Klimatologie.** [Methods and possibilities of a phenological climatology.] *Annalen der Meteorologie*, 4(1–6):97–108, **1951.** 5 figs., 4 tables, 2 refs. German and English summaries p. 97. **MH-BH**—Author emphasizes need for climatological summaries geared to natural periods of vegetation. He tabulates data for 5 periods limited by: oat sowing, apple blossom, winter rye harvest, winter rye sowing, and of field work. These are sub-divided into numerous minor periods. *Subject Headings:* **1. Phenology 2. Agricultural climatology.**—*C.E.P.B.*

INSTRUMENTS

(*See also items:* 3.4–7, 3.4–46, 3.4–58, 3.4–67, 3.4–191)

3.4–56 551.508.21

Georgi, Johannes and Haase, O., **Ein belüftetes Pyranometer.** [A ventilated pyranometer.] *Meteorologische Rundschau*, 4(9–10):188–192, Sept.–Oct. **1951.** 4 figs., 10 refs. **MH-BH**—Author first discusses depression of zero in a pyranometer by long wave radiation from glass cover. He mentions GORCZYNSKI's method of minimizing this and then describes a solarimeter ventilated internally. Laboratory tests are described and absorption and reflection by glass caps discussed. *Subject Heading:* **1. Pyrheliometers.**—*C.E.P.B.*

3.4–57 551.508.25 551.521.16

Atkins, W. R. G. and Jenkins, Pamela G., **Photoelectric measurements of the seasonal variations in daylight at Plymouth from 1947 to 1949.** *Royal Meteorological Society, Quarterly Journal*, 78(335):70–75, Jan. **1952.** 5 tables, 8 refs. **DWB**—Measurements of vertical daylight illumination (klx/hr) with a Burt vacuum sodium cell, 1930 Feb. 1941 and 1947–49, are tabulated as: daily maximum, day integral, annual total and percentage variations. Annual mean 116,486. Measurements are higher than those at Kew, especially in winter, owing to London pollution. No simple relations were found with rain or sunshine. Average cloud transmission 20–30%. *Subject Headings:* **1. Daylight illumination 2. Plymouth, England.**—*C.E.P.B.*

3.4–58 551.508.26:551.507.352

Vonnegut, Bernard, **Vortex thermometer for measuring true air temperatures and true air speeds in flight.** General Electric Research Laboratory, Contract DA-36-039-sc-15345, Project Cirrus, Final Report, Schenectady, July 30, **1951.** p. 57–80. 17 figs., 3 refs., 2 equations. **DWB**—The refrigeration obtained by mounting a thermometer in the center of a vortex can be used to balance the aerodynamic heating effect of the moving air and thus give

true air temperatures. The author demonstrates that by placing two thermometers in a vortex housing, one in the center of the vortex and one on the periphery, the true air speed can be calculated from the difference in the two thermometers' readings. Illustrated by elaborate diagrams and photographs and calibration curves. *Subject Headings:* **1. Thermometers 2. Airplane observations. I. General Electric Research Laboratory, Schenectady II. Contract DA-36-039-sc-15345.**—*G.T.*

3.4–59 551.508.27

Gloyne, R. W. and Smith, L. P., **Shielded thermometer mounts.** *Meteorological Magazine*, London, 80(949):203–204, July **1951.** ref. **DWB**—Comparisons of shielded mounts with Stevenson screens show that former give lower minima and higher maxima but differences are not great. *Subject Headings:* **1. Instrument shelters 2. Stevenson screens.**—*C.E.P.B.*

3.4–60 551.508.27

Mäde, O., **Temperaturbeobachtungen an vereinfachten Klimastationen.** [Temperature observations at simple climatic stations.] *Angewandte Meteorologie*, Berlin, 1(2):53–56, Sept. **1951.** 2 figs. Fuss, F., **Zur Frage der Temperaturmessung an vereinfachten Klimastationen.** [On the question of temperature measurements at simple climatic stations.] *Ibid.*, p. 56–59. 2 figs., 2 tables, 6 refs. **MH-BH**—Mäde points out that an agricultural auxiliary village station must be simple but observations must be comparable with official stations. Regular observing is facilitated by limiting observations to extreme daily temperatures. Working diagrams are given for a simple, cheap screen to house a Six's thermometer. Comparisons with standard gave sufficient accuracy (range 1°C too high). Fuss gives further comparisons. Simple screen is good enough in practice. Six's thermometer exposed on a roofed post in the open gave maxima too high by up to 4°C in summer. *Subject Headings:* **1. Thermometers 2. Thermometer screens. I. Fuss, F.**—*C.E.P.B.*

3.4–61 551.508.41

Miyake, T., **A simple mercury barometer with high magnification.** *Journal of Meteorological Research*, Tokyo, 3(6):230–233, March **1951.** 3 figs., table, 19 equations. In Japanese, English summary p. (15). **DWB**—The author observed the variations of atmospheric pressure using a high magnification mercury barometer. The theoretical calculation giving the temperature correction and actual examples are given. *Subject Heading:* **1. Mercurial barometers.** —*From author's abstract.*

3.4–62 551.508.43:551.547.1(02)

Gemperle, Albert, **Das Barometer als Höhenmesser, Orientierungsinstrument und Hilfsmittel zur Wettervorhersage.** [The barometer as a height measuring instrument, an orientation instrument and an aid in weather forecasting.] Bern, A. Francke, **1940.** 32 p. figs., diagrs., tables. **DLC**—A pocket manual for use in determining heights in mountains by means of aneroid barometers. The general principles of the barometer as a pressure instrument are first discussed and illustrated. Formulas for determining heights by the barometer, either directly or by means of pressure difference between two places (one known), the effect of pressure changes on accuracy of height determinations and other practical aspects of the use of barometers as guides in mountains are treated with tables and ample illustrations. Military uses for orientation by recognition of topography as shown on maps, in fog, darkness or snowstorms, mentioned. Rules for forecasting weather in mountains from barometer readings and other signs, given at some length. *Subject Headings:* **1. Aneroid barometers 2. Mountain meteorology 3. Altimetry 4. Manuals.**—*M.R.*

3.4–63 551.508.45

†Jakob, Max (*comp.*), **Studies of accuracy attainable in the measurement of atmospheric pressure by means of hypsometers.** Illinois Institute of Technology, Contract No. DA 36-039-sc-183, First Quarterly Progress Report, July 1, 1950 to Sept. 29, **1950.** 16 p. 64 refs. **DWB**—A selected bibliography of 64 items on boiling point measurement is presented. Various designs of high accuracy hypsometers that have been developed by other makers, other boiling point measuring apparatus, properties of water, temperature scales and resistance ther-

mometers, pressure measurements and control barometers, etc. and mercury glass thermometers are discussed briefly. *Subject Headings:* **1. Hypsometers 2. Instrument accuracy 3. Pressure measurement. I. Illinois Institute of Technology II. Contract DA 36-039-sc-183.**—*I.L.D.*

3.4–64 551.508.49:551.547.1

Graf, Anton, **Ein neuer Feindruckmesser, insbesondere für barometrische Höhemessungen.** [A new microbarometer, especially for barometric height measurements.] *Annalen der Meteorologie*, 4(1–6):286–291, **1951.** 5 figs., 3 tables. German and English summaries p. 286. **MH-BH**—Author describes a new microbarometer in which the deformation of a Bourdon tube is measured optically against a scale, thus avoiding errors due to friction. The accuracy of measurement is about 0.01 mm. Hg. *Subject Headings:* **1. Aneroid barometers 2. Altimetry.**—*C.E.P.B.*

3.4–65 551.508.71

Troeger, Heinz, **Gleichungen für die Ausdehnung des Haares in Hygrometern.** [Equations for the extension of the hair in hygrometers.] *Meteorologische Rundschau*, 4(9–10):185, Sept.–Oct. **1951.** 3 refs., equations. **MH-BH**—From Gay-Lussac's data author derives a hyberbolic formula relating extension to relative humidity and discusses its application. The coefficient of thermal expansion of hair is 22–24 x 10^{-6} instead of 34 x 10^{-6} usually accepted. *Subject Heading:* **1. Hygrometers.**—*C.E.P.B.*

3.4–66 551.508.765

Vonnegut, Bernard, **Continuous recording condensation nuclei meter.** General Electric Research Laboratory, Schenectady, Project Cirrus, Final Report, July 30, **1951.** p. 156–179. 13 figs., 5 refs. **DWB**—Account of continuous measurement of concentration of condensation nuclei by introducing air into a cloud chamber where it is humidified and expanded. The data are obtained from measurement of the light scattered by the cloud drops. Experiments made at Schenectady, Albuquerque and from an airplane are described and curves representing the recorded measurements reproduced. Conclusions are said to be premature but automatic recording condensation nuclei meter is claimed to show promise of being a valuable tool for investigating meteorological phenomena and air pollution problems. Instruments are illustrated in detail and numerous recorder records reproduced. *Subject Headings:* **1. Condensation nuclei 2. Nuclei counters 3. Albuquerque, New Mexico 4. Schenectady, N. Y. I. General Electric Research Laboratory, Schenectady II. Contract DA 36-039-sc-15345.**—*G.T.*

3.4–67 551.508.765 551.508.91

Vonnegut, Bernard and Neubauer, Raymond, **Detection and measurement of aerosol particles by the use of an electrically heated filament.** General Electric Research Laboratory, Project Cirrus, Schenectady, Final Report, July 30, **1951.** p. 317–334. 14 figs., 4 refs. **DWB**—Report on laboratory tests with a small electrically heated filament for counting and measuring aerosol particles of water and other vaporizable substances. Large number of variables such as wire diameter and length, air speed, wire heating current, temperature and composition, particle size and composition, etc. made research a difficult task. Preliminary investigations are claimed to suggest usefulness of the tool for obtaining information on number and size distribution of particles. *Subject Headings:* **1. Aerosol counters 2. Hot wire detectors. I. General Electric Research Laboratory, Schenectady II. Contract DA 36-039-sc-15345.**—*G.T.*

3.4–68 551.508.765:551.574:551.576.11

Warner, J. and Newnham, T. D., **A new method of measurement of cloud-water content.** *Royal Meteorological Society, Quarterly Journal*, 78(335):46–52, Jan. 1952. 6 figs., 6 refs. **DWB**—In a new instrument, attached to the wing of an aircraft, a 1 inch paper tape is driven past a 0.1 inch slit open to the air stream and resistance across tape measured by a milliameter. It was calibrated in a wind tunnel. Records indicate rapid variations of water content up to 0.4 gm/m³ in a few hundred feet and increase with height to near cloud top. *Subject Heading:* **1. Water content of clouds.**—*C.E.P.B.*

3.4–69 551.508.769:551.574.7

Ludlam, F. H., **The heat economy of a rimed cylinder.** *Royal Meteorological Society, Quarterly Journal,* 77(334):663–666, Oct. **1951.** fig., 10 refs. 7 equations. **MH-BH**—The heat loss of a rotating cylinder of given diameter flown through a supercooled cloud is discussed theoretically. A comparison of the results with theoretical liquid water content of Cu clouds shows that the rotating cylinder technique does not give the maximum concentration which may occur in Cu. *Subject Headings:* **1. Icing meters 2. Cumulus clouds 3. Supercooled water.**—*C.E.P.B.*

3.4–70 551.508.91

Junge, Christian, **Ein neues Verfahren zur Trennung der festen und tröpfchenartigen Teilchen im atmosphärischen Grobaerosol.** [A new procedure for separating the solid and liquid particles in coarse aerosol.] *Annalen der Meteorologie,* 4(1–6):40–45, **1951.** 9 figs., 2 refs. German and English summaries p. 40. **MH-BH**—Coarse aerosol is defined as particles with radius exceeding 2×10^{-5} cm. A study of Owens dust counter and Zeiss konimeter shows that on a surface of transparent lacquer only droplets (Z) are caught; droplets and solids (V) are both caught on a vaseline-coated surface but the smaller droplets become invisible. A number of measurements with increasing humidity are shown, using artificial particles ($CaCl_2$, NaCl, $CaSO_4$) and natural aerosol. Above 70% R.H. nearly all particles become droplets. *Subject Headings:* **1. Nuclei counters 2. Aerosols.**—*C.E.P.B.*

3.4–71 551.508.99:551.510.52:621.396.11

Crain, C. M. and Gerhardt, J. R., **Measurements of the parameters involved in the theory of radio scattering in the troposphere.** Texas, University, Electrical Engineering Research Laboratory, Contract N5 ori-136, Report No. 47, Nov. 30, **1950.** 22 p. 11 figs., table, 8 refs. **DWB**—Micrometeorological studies, using a recording refractometer and bead-type thermistor, have been made since 1948 at the University of Texas to determine refractive index in lowest 50 feet of the atmosphere. Traces are presented to show simultaneous recording of refraction index (for microwave transmission at 1, 2, 3, 12 and 32 feet above dry and moist ground and with varying weather conditions and temperature fluctuations). Refractive index related to small scale turbulence, stability, etc. Future program outlined. *Subject Headings:* **1. Radio scattering 2. Refractive index 3. Micrometeorology. I. Texas, University. Electrical Engineering Research Laboratory II. Contract N5 ori-136.**—*M.R.*

SYNOPTIC ANALYSIS AND FORECASTING

(*See also items:* 3.4–108, 3.4–114, 3.4–126, 3.4–140, 3.4–149, 3.4–171, 3.4–192)

3.4–72 551.509.1:551.524:551.54

Drogaĭtsev, D. A., **Elementy vektornogo analyza polia davleniia i temporatury vozdukha v Karskom more.** [Elements of vector analysis of a field of atmospheric pressure and temperature in the Kara Sea.] *Problemy Arktiki,* Leningrad, No. 2:59–74, **1944.** 14 tables, 2 equations. **DGS**—The author points out an important shortcoming of mean monthly charts of pressure and temperature, namely they do not allow one to establish the course of the elements from month to month or from year to year for a specific month. He, therefore, offers a method of graphic presentation of meteorological processes where the mean monthly values are expressed not in figures but in gradients, and the plotting on the same chart of values for a given period of time reveals the long range trend of the element. Charts constructed by this method for pressure and temperature in the eastern part of the Kara Sea for various periods of time—13 years (1930–1943), 4 years (1930–1934, 1934–1938), etc. disclose the trends of variation of these elements and their inter-relation. *Subject Headings:* **1. Weather charts 2. Atmospheric pressure 3. Air temperatures 4. Graphical presentation 5. Meteorological elements.**—*C.K.*

3.4–73 551.509.21

§**Winter strikes early in 1951.** *Weatherwise,* 4(6):131, 141–142, Dec. **1951.** chart. **DWB**—The synoptic conditions associated with the unusually early appearance of winter in 1951

with the accompanying heavy snow and rains are presented briefly. The weather chart for 1:30 a.m. Nov. 3, 1951 is given. *Subject Heading:* **1. Early winters.**—*I.L.D.*

3.4–74 551.509.25

Visconti, Italo and Urbani, Marcello, **Sulla costruzione delle carte previste.** [On the construction of a prognostic chart.] *Rivista di Meteorologia Aeronautica*, 11(1):29–31, Jan./March **1951.** Italian, French, English and German summaries p. 29. **MH-BH**—Brief article on the methods used in constructing surface and 700 mb prognostic charts in the forecast section of the Ispettorato Telecomunicazioni e Assistenze del Volo. Four approaches are used: 1) statistics of development of dynamic processes and types of weather, 2) isallobaric analysis, 3) PETTERSSEN'S method for speed of propagation of a system and 4) extrapolation based on past movements. For 700 mb charts, a method of kinematic analysis is used. Results of one year's experiments are tabulated for cyclonic and anticyclonic situations in terms of successful forecasts. *Subject Headings:* **1. Prognostic charts 2. Forecast verification 3. Synoptic analysis. I. Italy. Ispettorato Telecomunicazioni e Assistenza del Volo.** —*M.R.*

3.4–75 551.509.3(09)

†Douglas, C. K. M., **Reviews of modern meteorology—4. The evolution of 20th-century forecasting in the British Isles.** *Royal Meteorological Society, Quarterly Journal*, 78(335):1–21, Jan. **1952.** 15 refs. **DWB**—Before 1914 forecasting was empirical based on long experience. In 1914–18 upper air information became available and physical ideas including air mass entered increasingly. The inter-war period was mainly the development of the technique and the application of frontology; difficulties and helpful principles are discussed. Other advances were the use of the tephigram, steering and upper air topography. In 1939–46 the main developments were high-level aerology through radiosondes and reconnaissance flights and the use of prebaratics. The postwar period saw the attempt to apply 3-dimensional reasoning to the general development, thus improving upper wind forecasts, quantitative techniques and sferics. The positive result is small so far. *Subject Headings:* **1. History of meteorology 2. Weather forecasting.**—*C.E.P.B.*

3.4–76 551.509.3

Watanabe, T., **A note on Charney-Eliassen's numerical prediction.** *Journal of Meteorological Research*, Tokyo, 3(5):145–150, March **1951.** 7 figs., 6 refs., equations. In Japanese, English summary p. (11). **DWB**—The method of CHARNEY-ELIASSEN for predicting the height profile of the 500 mb surface along 45°N latitude is considered limited in its application because of the adoption of the small perturbation method. This limitation can be overcome by the generalized trajectory method which considers the effect of horizontal convergence. *Subject Headings:* **1. Mathematical forecasting 2. Perturbation method.** *I.L.D.*

3.4–77 551.509.312

Höhn, R., **Über den Jahresverlauf der absoluten und relativen Topographie im Zusammenhang mit Singularitäten, Grosswetterlagen und Wetterrhythmen.** [On the yearly variation of absolute and relative topography in connection with singularities, broad-scale weather conditions and rhythms in weather.] *Germany, Deutsche Demokratische Republik, Meteorologischer Dienst, Abhandlungen*, No. 4, **1951.** 39 p. 3 figs., 16 tables, 10 refs. **DWB**—Data for Aberdeen, Paris, Hamburg, Warsaw, and Stockholm are summarized for the period 1935–1944 and the average and extreme values tabulated and shown graphically. Daily means for the 10-year period are also plotted to show singularities, and much attention paid to each separate anomaly during the four seasons. Symmetries and periodicities are also dwelt on, but not at such great length. *Subject Headings:* **1. Relative topography 2. Singularities 3. Differential kinematics.**—*M.R.*

3.4–78 551.509.317

§Lamb, H. H., **The development of a method of estimating and forecasting winds at 10,000 feet over the North Atlantic.** *Eire, Meteorological Service, Geophysical Publications*, 3(3), **1951.** 8+p. charts, 3 tables. **MH-BH**—Since June 1941, charts of pressure at 10,000 feet have been used by the Irish Meteorological Service to calculate winds over the area between

the Rocky Mountains and Europe. Although the method described and illustrated is not perfect, it enables the service to give estimates of wind that would eliminate errors in flight planning of 2 hours or more for trans-Atlantic flights, even during absence of actual wind aloft data. Theory, application and a series of synoptic charts are included and discussed. *Subject Headings:* **1. Upper air wind forecasting 2. Synoptic analysis 3. North Atlantic.**—*M.R.*

3.4–79 551.509.317

§Neuwirth, R. and Caroli, Günther, **Die Anwendung der Labilitätskarte im praktischen synoptischen Dienst.** [The use of lability charts in the practical synoptic service.] *Baden, Landeswetterdienst, Jahresbericht mit Abhandlungen*, **1949.** p. 32–41. 4 charts, table, 6 refs. **Pt. II,** *ibid.*, **1950.** p. 66–78. 10 figs., 4 charts, 2 tables, 8 refs. **DWB**—The authors describe a method for constructing an instability chart from entropy values calculated for a specific elevation and from data on wind direction and velocity. The application of the instability chart to the construction of forecasting charts of relative topography is discussed. The validity of these charts is tested by actual weather situations and the influence of dynamic instability upon the behavior of regions of rising and falling pressure is considered. A table of entropy values at 5000 m and instability charts are presented. In Pt. II, NEUWIRTH defines static lability as difference between temperature at 500 mb and that given by moist adiabatic through 850 mb to 500 mb. Dynamic lability is defined as $\Delta v/(1-10\Delta E)$ at 5000 or 9000 m, where Δv is change of velocity in 100 km and ΔE is corresponding change of entropy. These are related to thunderstorm activity, frequency of precipitation and cloudiness. Charts of lability at 5000 m over western Europe are drawn for July 8–10, 1950 and related to areas of 24-hour forecasts of surface pressure change. *Subject Headings:* **1. Synoptic forecasting 2. Instability 3. Lability.**—*I.L.D., C.E.P.B.*

3.4–80 551.509.317/8

Ramage, C. S., **Analysis and forecasting of summer weather over and in the neighborhood of South China.** *Journal of Meteorology*, 8(5):289–299, Oct. **1951.** 29 figs., 15 refs. **MH-BH**—Surface isobars often of little use, rain areas being due to upper convergence. All weather patterns classified into: 1) tropical storms moving E. across Philippines; pre-storm fine spells are due to divergence in lower troposphere, 2) pressure waves in deep easterlies S. of oceanic highs, often without surface circulation, 3) broad deep southwesterlies, either dry with anticyclonic flow over China Sea or rainy (bai-u type) in which zones of velocity convergence travel downwind and 4) wedge advancing W. across China Sea or small anticyclone over China Sea causing 2–3 weeks drought. For each type a sequence of 10,000 ft stream lines and rain areas is given. *Subject Headings:* **1. Rainfall forecasting 2. Weather types 3. China.**—*C.E.P.B.*

3.4–81 551.509.33

Oosawa, K., **A normal broad-weather cycle in the "Baiu," the rainy season in Japan.** *Papers in Meteorology and Geophysics*, Tokyo, 2(1):45–51, March **1951.** 4 figs., 3 tables. In English. **MH-BH**—The broad weather trend of the "Bai-u," which is the rainy interval of June and July in Honshu, Japan, was investigated. The broad weather situation is represented by smoothing by the 5-day overlapping method the daily mean pressures and temperatures of July 1 to July 10 for 36 years. The normal values of pressure and temperature for 15 localities in Japan and adjacent regions (China, Korea, etc.) were determined and plotted on charts. Trend curves and data on singularities are given and the broad weather trend is described. *Subject Headings:* **1. Weather cycles 2. Bai-u 3. Japan.**—*I.L.D.*

3.4–82 551.509.34(04):551.586:63(02)

Bricaud, Pierre, **Quel temps fera-t-il demain?** [What will the weather be tomorrow?] Paris, Flammarion, **1946.** 145 p. 43 figs., tables. **DWB**—An elementary text on forecasting weather from barometric changes, state of the sky and simple weather maps, with special application to France. Many schematic diagrams and "rules-of-thumb" are presented. Special types of forecasts such as thunderstorm, fog, frost, etc. of interest to agriculture are treated briefly. *Subject Headings:* **1. Weather forecasting 2. Textbooks 3. France.**—*M.R.*

3.4–83 551.509.53

Mollwo, Hans, **Temperaturminimum und Taupunkt.** [Temperature minimum and dew point.] *Meteorologische Rundschau*, 4(9–10):175–178, Sept.–Oct. **1951.** 3 figs., 2 tables, 2 refs. **MH-BH**—From hourly data at Frankfurt a.M. on fog-free cloudless nights, author examines relations between maximum temperature, daily range and dew point in each month and obtains a diagram and table showing cooling to be expected, given midday temperature and date. Forecasting night frosts is briefly discussed. *Subject Headings:* **1. Frost forecasting 2. Temperature forecasting.**—*C.E.P.B.*

3.4–84 551.509.532

Jefferson, G. J., **Forecasting ground frost.** *Meteorological Magazine*, London, 80(952):295–296, Oct. **1951.** fig., table. **MH-BH**—Test of ground frost criterion $T+D/2$ less than 79°F (T=screen temperature, D=dew point, both at 14 hr) on data for Hullavington gave good results. *Subject Heading:* **1. Frost forecasting.**—*C.E.P.B.*

3.4–85 551.509.6:551.481

Jaeger, Fritz, Schmauss, A. and Flohn, Hermann, **Bemerkungen zum Atlantropa-Projekt.** [Remarks on (Sörgel's) Atlantropic Project.] *Erdkunde*, Bonn, 5(2):176–180, **1951.** table, refs. **DLC**—A discussion of SÖRGEL's plan to improve the climate of Africa by constructing great artificial lakes. JAEGER objects that ¾ million km² of productive land would be flooded and the water lost by evaporation. SCHMAUSS thinks the consequences unpredictable. FLOHN, arguing from small rainfall of subtropical islands, does not think rainfall would be increased. *Subject Headings:* **1. Artificial influences 2. Climatic amelioration 3. Africa.**—*C.E.P.B.*

3.4–86 551.509.6

Weinländer, A., **Meteorologische Erscheinungen beim Stadtbrande Münchens.** [Meteorological phenomena accompanying the Munich city fire.] *Meteorologische Rundschau*, 4(7/8):132–135, July/Aug. **1951.** 9 figs. **MH-BH**—On April 25, 1944 an extensive fire followed an incendiary raid on Munich. A temporary local convergence was superposed on the existing light S.W. wind; this was followed by a strengthening of the wind, rise of temperature and decrease of humidity. Smoke and fire Cu. described. Calculated release of heat, 2.3×10^6 k.cal/sec, was too small to affect general weather situation. *Subject Headings:* **1. Smoke 2. Artificial influences.**—*C.E.P.B.*

3.4–87 551.509.6:551.46

Wundt, Walter, **Die hydrographische und klimatische Auswirkung der Abdämmung von Meerengen.** [The hydrographic and climatic effects of damming straits.] *Petermanns Geographische Mitteilungen*, 94(4):212–215, **1950.** 7 refs. **DLC** Considers effects of blocking outlets to Baltic, Black Sea, Red Sea and Mediterranean. Baltic would rise, giving great water power; an enlarged Black Sea overflowing to Caspian would increase rainfall of southern Russia. Red Sea would fall 200 m in 140 years and give great water power. Mediterranean 100–200 m lower would give much new land but decrease rainfall. Other projects discussed are damming Congo, diverting Gulf Stream and Siberian rivers. No great change in the general atmospheric circulation is possible but minor changes might be important. *Subject Headings:* **1. Artificial influences 2. Ocean currents.**—*C.E.P.B.*

3.4–88 551.509.62

Callendar, G. S., **Effect of shelter hedges on mean temperature.** *Meteorological Magazine*, London, 80(952):294–295, Oct. **1951.** table. **MH-BH**—Concludes that increasing height of trees round Eskdalemuir Observatory has not affected mean temperature. *Subject Headings:* **1. Windbreaks 2. Eskdalemuir, Scotland.**—*C.E.P.B.*

3.4–89 551.509.62:632.1

Rogers, W. S. and Beakbane, A. Beryl, **The effect of netting and Hessian anti-frost screens and of brick walls on air temperatures.** *East Malling Research Station, Annual Report*, 1950: 60–64, **1951.** 6 figs., 2 tables. **GB-MO** -Experiments in a walled garden 1947–1949 showed that 1/32 inch mesh string netting had no effect on minimum temperature. Beneath a Hessian

screen minima were 4–5°F higher than on open wall. On the wall maxima were higher than 5 ft away but the differences of minima were barely significant. Box-like Hessian screens in the open raised minima by 1–2°F. *Subject Headings:* **1. Frost protection 2. Fruit culture.**—*C.E.P.B.*

3.4–90 551.509.67

Bowen, E. G., **A new method of stimulating convective clouds to produce rain and hail.** *Royal Meteorological Society, Quarterly Journal*, 78(335):37–45, Jan. **1952.** 5 figs., 2 tables, 5 refs. **DWB**—Assuming that droplets, larger than existing natural ones but small enough to be carried up, will grow by coalescence, calculations show that droplets of diameter about 50μ introduced into base of a convective cloud will fall out after 20–60 min with a diameter more than 1 mm. Experiments with spraying from an aircraft were made at Sydney, Australia. In cloud less than 5000 ft thick, 6 produced virga of a few drops less than 0.5 mm and one had no result. In cloud more than 5000 ft thick, 1 light, 2 heavy and 1 very heavy showers occurred. In 8 of 11 cases the cloud dissipated. *Subject Headings:* **1. Artificial precipitation 2. Cloud seeding.**—*C.E.P.B.*

3.4–91 551.509.8

Levert, C., **Heeft Maart negen zomerse dagen?** [Does March have nine summery days?] *Hemel en Dampkring*, 49(9):159, **1951.** table. **DLC**—A discussion of the weather rule that March has 9 summer days. It depends on the temperature limit: De Bilt March 1898–1950 had a mean of 13 above 10°C. *Subject Heading:* **1. Weather lore.**—*C.E.P.B.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE—IONOSPHERE

(*See also items:* 3.4–9, 3.4–71)

3.4–92 551.510:523.4

Davidson, Martin, **The atmospheres of the earth and planets.** *Science News*, London, 18:93–104, **1950. DLC**—A very readable summary of: **The atmospheres of the earth and planets.** University of Chicago Press and Cambridge [Eng.] University Press, 1949. (*See item* 10–4 in Oct. 1950 *Meteorological Abstracts.*) Includes rocket studies, meteor paths, geological history and atmospheres of Mars, Saturn and Jupiter and their satellites. *Subject Headings:* **1. Atmospheric structure 2. Planetary atmospheres.**—*C.E.P.B.*

3.4–93 551.510(04)

Chapman, Sydney, **Some phenomena of the upper atmosphere.** *Physical Society of London, Proceedings, Ser. B*, 64:833–844, **1951.** 3 figs., 18 refs. **DWB**—A rapid survey of the physics and chemistry of the upper atmosphere with suggestions for future investigation. Latest views are summarized on temperature (troposphere, stratosphere, mesosphere, thermosphere), composition (homosphere, heterosphere) and ionization or electron density (neutrosphere, ionosphere). Uncertainties in chemical composition and relations between turbulent mixing, diffusion and photochemical action are discussed. Other notes include atmospheric emission spectra (airglow), entry of solar hydrogen into the atmosphere, nuclear chemistry (influence of cosmic rays), ionospheric variation and auroral and equatorial electrojets. *Subject Headings:* **1. Upper atmosphere 2. Physics of the atmosphere 3. Atmospheric composition 4. Ionosphere.**—*C.E.P.B.*

3.4–94 551.510.41:551.1

Quiring, H., **Entstehung der Erdatmosphäre.** [Development of the earth's atmosphere.] *Meteorologische Rundschau*, 4(9–10):172–175, Sept.–Oct. **1951.** 2 tables. **MH-BH**—Partly on basis of planetary atmospheres, author traces development from "Star-time" to Eozoic. Beginning with monatomic incandescent gases, atmosphere was successively mainly H_2+CO, then 98% water vapor. From beginnings of ocean, CO_2 increased to about 80%, with 15% nitrogen. There was no oxygen until it was formed by bacteria in Silurian. *Subject Heading:* **1. Atmospheric evolution.**—*C.E.P.B.*

3.4–95 551.510.41:551.574.1:551.46

Woodcock, Alfred H., **Impact deposition of atmospheric sea salts on a test plate.** Woods Hole Oceanographic Institution, Marine Meteorology, Contract N6onr-27702, Technical Report No. 10, July 1951 [16 p.] 12 figs., 4 tables, refs. Reprint from: *American Society for Testing Materials, Proceedings*, 50:1115–1116, 1950. **DWB**—Experiments, made in the Block Island region for determining weight and number of atmospheric sea salt nuclei in marine winds through measurements of deposition on test plates, are reported in this paper and results shown in tables and photomicrographs. Several comments on the work of other experts and the author's evaluation of the same are added. *Subject Headings:* **1. Saline nuclei 2. Atmospheric composition 3. Block Island, Rhode Island. I. Woods Hole Oceanographic Institution II. Contract N6onr-27702(NR-082-021).**—*G.T.*

3.4–96 551.510.42

McDonald, James E., **Remarks on "Sea salt in a tropical storm."** *Journal of Meteorology*, 8(5):362–363, Oct. 1951. Reply by Woodcock, Alfred H., p. 363. **MH-BH**—McDonald queries conclusions by Woodcock (*see item* 2.4–52 in April 1951 *Meteorological Abstracts*) that significant latent heat is released by condensation on salt nuclei. Woodcock replies that it may create instability. *Subject Headings:* **1. Saline nuclei. I. Woodcock, Alfred H.**—*C.E.P.B.*

3.4–97 551.510.5(04)

Wood, C. A., **I'll go higher than you.** *Weather*, 6(9):267–276, Sept. 1951. 3 figs. **DWB**—A popular dialogue on structure of the atmosphere up to 500,000 ft. *Subject Heading:* **1. Atmospheric structure.**—*C.E.P.B.*

3.4–98 551.510.53

Humphries, J., **The earth's atmosphere.** *British Interplanetary Society, Journal*, 10:18–26, 1951. **DLC**—Popular article on upper atmospheric structure based mainly on Grimminger, Rand Report R. 105, 1948. *Subject Heading:* **1. Structure of the stratosphere.**—*C.E.P.B.*

3.4–99 551.510.534

Reed, Richard J. and Julius, Anthony L., **A quantitative analysis of two proposed mechanisms for vertical ozone transport in the lower stratosphere.** *Journal of Meteorology*, 8(5):321–325, Oct. 1951. 2 figs., 2 tables, 15 equations, 15 refs. **MH-BH** Investigates distribution of non-equilibrium ozone (amount in excess of photochemical equilibrium below level of maximum concentration). An equation for changes of ozone density in 10–20 km is derived involving the meridional circulation and turbulent vertical mixing. Each of these terms is evaluated assuming it to be the sole cause of the known distribution by month and latitude. The meridional circulation is ineffective unless it extends over both hemispheres, but stratospheric austausch coefficients of 1 to 20 g/cm/sec can explain the observed variations of non-equilibrium ozone. *Subject Heading:* **1. Ozone variations.**—*C.E.P.B.*

3.4–100 551.510.535:551.524.7

†Gerson, N. C., **A critical survey of ionospheric temperatures.** *Physical Society of London, Reports on Progress in Physics*, 14:316–365, 1951. 18 figs., 10 tables, 142 refs., 116 equations. **DLC**—A survey of methods of inferring the temperature of the atmosphere using basic ionospheric equations. Probable mean annual temperatures in middle latitudes given by collisional frequencies; auroral scale heights and electron concentration are tabulated, showing an increase from 219–300°K at 100 km to a maximum of around 3450°K at 400 km. It is tentatively considered that there are no large diurnal temperature variations. *Subject Headings:* **1. Upper air temperatures 2. Ionosphere.**—*C.E.P.B.*

3.4–101 551.510.535

Helliwell, R. A., Mallinckrodt, A. J. and Kruse, F. W., Jr., **Fine structure of the lower ionosphere.** *Journal of Geophysical Research*, 56(1):53–62, March 1951. 6 figs., 10 refs. Comments by R. J. Nertney, *ibid.*, 56(3):449–451, Sept. 1951. fig. **DWB**—Ionospheric echoes for 100 and 325 kc pulses show splitting at night in the range between 90 and 130 km. Of 4

possible explanations, the one which agrees best with experimental data is that there are several reflecting strata between 90 and 130 km, the lower strata being semitransparent to low frequency radio waves. Models of the E layer, to account for the exact form of the layers and their behavior, are presented. *Subject Headings:* **1. Ionospheric structure 2. E layer 3. Radio propagation. I. Nertney, R. J.**—*M.R.*

3.4–102 551.510.535:621.317.9:621.396.11

Naismith, R. and Bailey, R., **An automatic ionosphere recorder for the frequency range 0.55–17 Mc./s.** *Institution of Electrical Engineers, Proceedings*, London, Pt. 3, 98:11–18, Jan. 1951. Reprint No. 1010. **DBS** The servo-electric ionospheric recorder in use at the Radio Research Station, Slough, is described. This type of equipment has been in use for over 6 years producing hourly records of equivalent height of reflection of radio waves as a function of frequency. *Subject Headings:* **1. Ionospheric recorders 2. Radio wave propagation.**—*C.E.P.B.*

3.4–103 551.510.535

Schindelhauer, F., Schrader, A. and Höringer, Cl., **Berechnung der Höhe der unteren Schichten der Ionosphäre aus der Wellenform der Luftstörungen.** [Calculation of the height of the lower layers of the ionosphere from the wave form of atmospheric disturbances.] *Zeitschrift für Meteorologie*, 5(9):277–284, Sept. 1951. 5 figs., table, 12 refs. **MH-BH**—Reflections of electromagnetic impulses between earth and ionosphere produce a whistle in telephones, tone depending on wave length. These impulses were converted to variations of field potential and recorded by oscillograph (Oct. 1948–Aug. 1950; setup shown). From these records the heights of reflecting layers were calculated. Frequency shows a sharp maximum at about 35 km especially by day (C level) and others at 65 (D) and 80–90 km (E). Number of occurrences related to solar activity. Diurnal and other changes of height are described; all levels are lower by day than night. Two possible causes are discussed—partial discharges and particle shower formation by cosmic rays. *Subject Headings:* **1. Ionospheric structure 2. Solar activity.**—*C.E.P.B.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

(*See also items:* 3.4–122, 3.4–137, 3.4–139, 3.4–164)

3.4–104 551.511

Arakawa, H., **Equations of motion in the system of natural coordinate.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(5):176–179, May 1951. 2 figs., 2 refs., 10 equations. In Japanese, English summary p. 179. **MH-BH** A brief discussion of the equations of motion parallel and normal to the isobars with reference to a circular depression. *Subject Headings:* **1. Depressions 2. Equations of motion.**

3.4–105 551.511

Jung, Karl, **Die Corioliskraft im Anfangsunterricht.** [An introduction to the Coriolis force.] *Deutsche Hydrographische Zeitschrift*, Hamburg, 4(1–2):46–51, 1951. 5 figs., equations, 6 refs. Summary in German, English, French p. 46–47. **DWB**—A simple diagrammatic-mathematical exposition of the deviating force (eastwards, northwards, downwards) of the earth's rotation on a moving object. *Subject Heading:* **1. Coriolis force.**—*C.E.P.B.*

3.4–106 551.511:551.524:551.558.1

Montgomery, R. B., **Vertical convective heat flux.** *Royal Meteorological Society, Quarterly Journal*, 77(334):675–678, Oct. 1951. 6 refs., equations. Reply by G. D. Robinson p. 678–680. 4 refs. **MH-BH**—Montgomery compares his 1948 definition of vertical eddy flux of heat with G. D. Robinson's (*see item* No. 2.5–65 in May 1951 *Meteorological Abstracts*), and discusses various other practically equivalent formulas. Some other points in Robinson's paper are criticized. Robinson comments on Montgomery's criticisms. *Subject Headings:* **1. Eddy conductivity 2. Vertical motion. I. Robinson, G. D.**—*C.E.P.B.*

3.4–107 551.511:636.7(02)

Morán Samaniego, Francisco, **Apuntes de termodinámica de la atmósfera.** [Contribution on the thermodynamics of the atmosphere.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. B*, No. 4, **1944.** 345 p. 107 figs., 189 equations, biblio. p. 3–4. **DWB** —This is a comprehensive text intended for advanced students of meteorology. It begins with 30 pages on basic thermodynamics (enthalpy, the perfect gas and air as a perfect gas). Chapter II deals with the properties of any air (stratification, stability, vertical motions, potential temperature, isentropic motions, subsidence, etc.). Chapter III takes up the properties of saturated air and the concept of vertical temperature. Chapter IV deals with condensation, latent heat, energy transport through evaporation and condensation, Chapter V, change of state (freezing, evaporation, sublimation, condensation nuclei, fogs, haze); Chapter VI, adiabatic processes; Chapter VII, atmospheric precipitation and cloud physics; and Chapter VIII, thermodynamics and diagrams. A very practical treatise from a meteorologist's viewpoint. *Subject Headings:* **1. Dynamic meteorology 2. Thermodynamics of the atmosphere 3. Tephigrams 4. Change of state. I. Spain. Servicio Meteorológico Nacional.**—*M.R.*

3.4–108 551.511:551.509.317

Sawyer, J. S. and Matthewman, A. G., **On the evaluation of terms of a type arising in Sutcliffe's treatment of cyclonic development.** *Royal Meteorological Society, Quarterly Journal*, 77(334):667–671, Oct. **1951.** 3 figs., 2 refs., 9 equations. **MH-BH**—A method is described, suitable for use in forecasting, of evaluating terms involving geostrophic wind vector and vortices in the geostrophic wind field. As an example, SUTCLIFFE's cyclonic development term (1947) is evaluated from isohypses of height of 1000 and 500 mb surfaces over N. Atlantic and W. Europe on Feb. 5, 1950. *Subject Headings:* **1. Cyclogenesis 2. Vorticity.**—*C.E.P.B.*

3.4–109 551.511:551.515

Schmitz, Hans Peter, **Über die Krümmung der Luftbahnen in den Druckgebieten mittlerer Breiten.** [On the curvature of the air trajectories in pressure regions of middle latitudes.] *Zeitschrift für Meteorologie*, 5(11):321–322, Nov. **1951.** 5 refs., 7 equations. **MH-BH** —Author shows that with centrifugal force acting in the same direction as gradient force, the wind speed has an upper limit which decreases with increasing friction and latitude. In agreement with H. ERTEL, he finds that in all moving pressure centers the curvature of the air paths is anticyclonic. *Subject Heading:* **1. Air trajectories.**—*C.E.P.B.*

3.4–110 551.511:551.596.1:534

†Scorer, R. S., **Sonic and advective disturbances.** *Royal Meteorological Society, Quarterly Journal*, 78(335):76–81, Jan. **1952.** 13 refs. **DWB** An interesting comparison of the atmospheric processes involved in atomic explosions "little bangs" which are shock waves, "big bangs" like Krakatoa and the Siberian meteorite (compression-gravity waves) and slow distributed heating giving rise to advective disturbance and mass transport by wind. It is concluded that all meteorological effects are advected with the air, none propagated through it. *Subject Headings:* **1. Advection theory 2. Explosion waves.**—*C.E.P.B.*

3.4–111 551.511

Truesdell, Clifford A. T., **On Ertel's vorticity theorem.** *Zeitschrift für angewandte Mathematik und Physik*, 2(2):109–114, March **1951.** fig., 13 equations. In English, German summary p. 114. **DLC** —A generalization by ERTEL of SILBERSTEIN's vorticity theorem is discussed and applied to viscous compressible fluids. A special application is to the flow of an incompressible inhomogeneous fluid, in which as the density becomes more nearly uniform the vorticity increases without limit. *Subject Heading:* **1. Vorticity.**—*C.E.P.B.*

3.4–112 551.511:551.542.1

Watanabe, T., **Dynamical significance of the horizontal baroclinic field.** *Journal of Meteorological Research*, 3(5):139–144, March **1951.** 2 figs., table, 8 equations. In Japanese, English summary p. (11). **DWB**—The author discusses theoretically the effect of baroclinic field upon the variations of atmospheric pressure. A numerical example indicating that the

baroclinic effect is very important in the variations of atmospheric pressure is given. A general formula representing the effect of polytropic changes of density of air particles on the variation of atmospheric pressure is developed. *Subject Headings:* **1. Baroclinic fields 2. Pressure variations.**—*I.L.D.*

3.4–113 551.511

White, Robert M. and Jung, Glenn H., **Large-scale atmospheric exchange processes as diffusion phenomena.** *Journal of Meteorology*, 8(5):356–358, Oct. **1951.** 3 tables, 3 equations, 6 refs. **MH-BH**—Various methods of computing the gross-austausch coefficient A_ϕ in the atmosphere are discussed. To check the applicability of the diffusion analogy to large scale exchange of sensible heat, direct geostrophic evaluations are made of the flux and its coefficient of variability in layer 1013–500 mb for periods 1–12 days. Variability of daily values is large and the diffusion concept cannot be applied to daily values especially in high latitudes. Moreover, correlations between heat-flux and temperature gradient are small and generally negative. *Subject Headings:* **1. Grossaustausch 2. Heat exchange.**—*C.E.P.B.*

GENERAL CIRCULATION

(*See also items:* 3.4–36, 3.4–126)

3.4–114 551.513:551.515:551.509.3

†Eady, E. T. and Sawyer, J. S., **Reviews of modern meteorology—3. Dynamics of flow patterns in extra-tropical regions.** *Royal Meteorological Society, Quarterly Journal*, 77(334): 531–551, Oct. **1951.** 53 refs., 14 equations. **MH-BH**—"The aim of this article is to elucidate some of the basic concepts and lines of thought in modern research." It opens with a description of the jet stream and blocking action in upper troposphere. Authors then discuss equations of motion of a frictionless fluid, the barotropic theory of long waves, and the development of cyclones and anticyclones by relative divergence, with special reference to the work of SUTCLIFFE. Discussions of the stability of atmospheric motion and dynamical instability lead to a study of baroclinic disturbances (CHARNEY and EADY). The possibility of *computing* the weather forecast is discussed not unhopefully. Brief references are made to experiments in dynamical meteorology and to small scale topographic effects. *Subject Headings:* **1. Dynamic meteorology 2. Waves in the westerlies 3. Jet stream.**—*C.E.P.B.*

3.4–115 551.513:551.465

Iselin, Columbus O'Donnell, **Some common characteristics of the Gulf Stream and the atmospheric jet stream.** *New York Academy of Sciences, Transactions, 2nd Ser.*, 13(2):84–86, Dec. **1950.** 5 refs. **DLC**—The author summarizes recent theoretical investigations on the course of the Gulf Stream and the results of the R. FLEMING expedition of June 6–22, 1950, which investigated in detail the path of the current and the characteristics of its motion. Similarities between the Gulf Stream and jet stream are pointed out as the result of the fact that both are general phenomena characteristic of the circulation within a thin envelope on a rotating sphere. *Subject Headings:* **1. General circulation 2. Jet stream 3. Gulf Stream.**—*I.L.D.*

3.4–116 551.513

Rudloff, Willy, **Die Driftzahl oder der atmosphärische Drehimpuls als Zirkulationsmass.** [The drift number or the atmospheric angular momentum as a measure of the circulation.] *Annalen der Meteorologie*, 4(1–6):14–26, **1951.** 9 figs., 15 refs. German and English summaries p. 14. **MH-BH**—Drift number D is the mean component of the angular momentum of the atmosphere parallel to latitude relative to the earth. Daily values are calculated from the pressure field, assuming geostrophic winds, for the Atlantic–European region, June 1948–July 1950. It is a measure of the zonal circulation. Daily and extreme values are compared with sunspot numbers, with a +correlation. Values of total angular momentum as well as D are computed for BAUR's 25 general weather types. Reference is made to possible use in long range forecasting and to similar American work. *Subject Heading:* **1. Zonal circulation.**—*C.E.P.B.*

3.4–117 551.513:551.588.1

Wippermann, Friedrich, **Zur Frage des Einflusses der Land- und Meerverteilung auf die Lage der quasistationären Tröge in einer atmosphärischen Zonalzirkulation.** [On the question of the influence of the land and sea distribution on the position of the quasistationary troughs in an atmospheric zonal circulation.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 4:112–121, **1951.** 3 figs., 13 refs., 15 equations. German, English and French summaries p. 112. **DWB**—Streamlines at 500 mb show three quasistationary troughs related to land and sea distribution. Author investigates factors causing these and adds to a computation by CHARNEY and ELIASSEN (*see item* 2–48 in Feb. 1950 *Meteorological Abstracts*) of the effects of topography, the effect of the gain and loss of heat by conduction from the surface and by radiation. He finds this more important than topography; the two together give a satisfactory reproduction of the height of the 500 mb surface. *Subject Headings:* **1. Waves in the westerlies 2. Orographic effects.**—*C.E.P.B.*

3.4–118 551.513.1:629.13

Gray, George J., Jr., **Jet streams and aircraft operations.** *Weatherwise*, 4(5):99–101, 114, Oct. **1951.** 2 figs. **MH-BH**—A nontechnical description of the characteristics of the jet streams: their location, speed, life cycle pattern and relation to local circulation. A diagram showing a simplified version of a jet stream associated with a frontal system is given and analyzed. *Subject Headings:* **1. Jet stream 2. Aeronautical meteorology 3. Upper air winds.** —*I.L.D.*

3.4–119 551.513.1

Hollmann, Günther, **Beitrag zu einer Theorie der Entstehung ortsfester Druckgebilde (I).** [Contribution to a theory of the development of stationary pressure formations (I).] *Zeitschrift für Meteorologie*, 5(9):258–267, Sept. **1951.** 2 figs., 9 refs., 68 equations. **MH-BH** – Author calculates that long ("planetary") waves in the troposphere may become unstable when the temperature gradient over a definite pressure formation lies between limits which depend on the wave length and the zonal and meridional extent of the formation. Large formations build up faster than small ones but require a greater meridional temperature gradient to do so. The time required is a few days. While the amplitude is increasing there is increasingly effective coupling between upper and lower pressure field. The calculations agree with the wind shear observed in winter. Stability criteria based only on dynamical assumptions are insufficient; a calculable distribution of heat sources is also required. Since this is generally unknown, a change in the general weather situation cannot be forecast on synoptic grounds. *Subject Headings:* **1. Atmospheric circulation 2. Waves in the westerlies.** –*C.E.P.B.*

3.4–120 551.513.1:551.557

Rossby, Carl-Gustav, **Über die Vertikalverteilung von Windgeschwindigkeit und Schwerestabilität in Freistrahlbewegungen der oberen Troposphäre.** [On the vertical distribution of wind velocity and gravitational stability in free striated motion of the upper troposphere.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 4:3–23, **1951.** 6 figs., 6 refs., 80 equations. German, English and French summaries p. 3–4. **DWB**—Wind distribution at 200–300 mb over North America often shows, especially in summer, parallel shallow streaks of high velocity (local jet streams, sometimes over 100 knots) separated by much lighter winds and with feeble winds above 150 mb and below 400–500 mb. They are of limited length and probably transient. Several examples are shown by charts and vertical sections. This distribution is tentatively related to the condition of minimum transport of momentum across a vertical section through the current. A basic relation between the vertical gradients of wind velocity and potential temperature, satisfying this condition, is derived (eq. 65). "Stratified currents approaching this limiting state will normally pick up speed in the center and shrink in depth." *Subject Headings:* **1. Jet stream 2. Troposphere.**—*C.E.P.B.*

3.4–121 551.513.1:551.557

Starr, V. P. and White, R. M., **Note on the seasonal variation of the meridional flux of angular momentum.** *Royal Meteorological Society, Quarterly Journal*, 78(335):62–69, Jan. 1952. fig., 5 tables, 2 refs. **DWB**—In continuation of earlier work (*see item* No. 2.6–52 in

June 1951 *Meteorological Abstracts*) total meridional transport of relative angular momentum across 30°N, 2000–50,000 ft, is calculated for a whole year from 19 stations. The flux is about twice as great in winter as in summer. The annual variation required by the variation of middle latitude westerlies is accounted for by the variation in the horizontal eddy flux. The yearly mean is 30.9×10^{25} c.g.s. units, in good agreement with C. H. B. Priestly. *Subject Headings:* **1. General circulation 2. Momentum transfer 3. Energy transport.**—*C.E.P.B.*

3.4–122 551.513.2:551.511

Kuo, Hsiao-lan, **Vorticity transfer as related to the development of the general circulation.** *Journal of Meteorology*, 8(5):307–315, Oct. 1951. 4 figs., 27 equations, 13 refs. **MH-BH**—Since a W. jet has relative cyclonic vorticity to N. and anticylonic to S., an increase requires a transfer of vorticity more than enough to balance friction. Over a whole circle of latitude over a long time, this is mainly by large-scale eddy motion caused by a force driving cyclonic vortices towards regions where the (higher) absolute vorticity equals their own. This is shown to result in W. and E. zonal currents. The transfer may be due to damped high level wave motion as well as to closed streamlines. Time required to build up a zonal current is about 20 days agreeing with observation. Zonal winds in winter and summer computed on this basis agree with observed mean winds at 12 km. *Subject Headings:* **1. Zonal circulation 2. Vorticity.**—*C.E.P.B.*

3.4–123 551.513.2:551.583.3:525.3

Rubashev, B. M., **Vekovye izmeneniia skorosti vrashcheniia zemli i nekotorye cherty obshcheĭ tsirkuliatsii zemnoĭ atmosfery v geologicheskom proshlom.** [Secular change in the speed of rotation of the earth and some notes in the general circulation of the earth's atmosphere in the geological past.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia*, 83(2):152–155, March–April 1951. 15 refs., table, 2 equations. **DLC** The author tests the hypothesis of P. I. Brounov that the more rapid rotation of the earth about its axis during past geological ages led to a displacement of the subtropical anticyclones to lower latitudes and hence to the ice ages. On the basis of evidence of the gradual diminution of the earth's angular velocity, the latitudinal position of the subtropical anticyclones during the various geological periods is determined. It is concluded that while in earlier geological ages the paths of the cyclones were in lower latitudes than at present, nevertheless the principal cause of glaciation was the cyclical variation of a climate resulting from the cyclical variation of solar activity. *Subject Headings:* **1. General circulation 2. Geological climates 3. Rotation of the earth.**—*I.L.D.*

3.4–124 551.513.2:551.552

Schmidt, F. H., **Streamline patterns in equatorial regions.** *Journal of Meteorology*, 8(5):300–306, Oct. 1951. 7 figs., table, 16 equations, 6 refs. **MH-BH**—A discussion of the cause of W. winds near equator, based on kinematics of tropical air currents. Cases discussed are: a broad monsoon current crossing the equator, the calculated stream lines agree with observed (Indian Ocean, July); a high pressure belt near equator giving a stationary current (converse of easterly current of doldrums); a line of convergence near and parallel to equator, the calculated winds becoming westerly near convergence, in agreement with observations. The oceanic equatorial counter current may also be due to convergence. *Subject Headings:* **1. Wind distribution 2. Equatorial meteorology.**—*C.E.P.B.*

3.4–125 551.513.2:551.557.3

Vulfson, N. I., **Raschet nezonal'nogo sluchaia statsionarnoĭ tsirkuliatsii atmosfery.** [Calculation of a nonzonal stationary atmospheric circulation.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geofiz.*, No. 2:56–74, 1951. 12 figs., 18 refs., 12 equations. **DLC**—The existence of a relatively independent summer circulation over southern Europe, northern Africa and southwestern Asia and the determination of the climate of southern Europe, Kazakhstan and Central Asia by this circulation are demonstrated. The existence of this circulation is proven by a calculation of the velocities of its constituent winds. The case of nonzonal stationary circulation of the atmosphere is considered. Horizontal sections of atmospheric flow at 1000, 5000 and 10,000 m for July and January and also vertical sections along 30° west longitude; 0°, 0° and 60° east longitude, along 20° latitude for July and along 40° and 20° latitude for January

are given. The mean intensity of vertical flow in July from ground level to the mean height of cirrus clouds is compared with the various moisture zones over Europe, northern Africa and central and southwestern Asia. *Subject Headings:* **1. Atmospheric circulation 2. Seasonal winds 3. Upper air winds 4. Southern Europe 5. Northern Africa 6. Southwestern Asia.**—*I.L.D.*

ATMOSPHERIC DISTURBANCES

(*See also items:* 3.4–109, 3.4–114, 3.4–202, 3.4–204)

3.4–126 551.515:551.513:551.509.3

Eliassen, A., Eady, E. T. and Sawyer, J. S., **Dynamics of flow patterns in extra-tropical regions.** *Royal Meteorological Society, Quarterly Journal*, 78(335):111–113, Jan. **1952.** 3 refs. **DWB**—Criticism by ELIASSEN of discussion by EADY and SAWYER (*see item* No. 3.4–114 above) of SÖLBERG's stability criterion for a circular vortex. Reply by authors. *Subject Headings:* **1. Dynamic meteorology 2. Waves in the westerlies.**

3.4–127 551.515.1

James, R. W., **Large-scale vortex motion in the atmosphere.** *Royal Meteorological Society, Quarterly Journal*, 78(335):111, Jan. **1952. DWB**—Replies to criticisms by A. H. R. GOLDIE of paper by JAMES (*see items* No. 9–53 and 2.10–65 in Sept. 1950 and Oct. 1951 *Meteorological Abstracts*). *Subject Headings:* **1. Cyclones 2. Vorticity.**

3.4–128 551.515.11

Wagemann, Hellmut, **Ergänzungen und Anwendungen der Zyklonentheorie.** [Completion and application of the theory of cyclones.] *Meteorologische Rundschau*, 4(9–10):169–172, Sept.–Oct. **1951.** 4 figs., equation. **MH-BH**—Author examines some observed modifications of the ideal BJERKNES cyclone. KRUHL's "induced" cyclone occurs when the normal temperature gradient across the front is reversed. The track deviates to right and the greatest wave instability does not coincide with strongest wind discontinuity. A third type is a cold air disturbance in which the surface winds are opposite to the upper warm winds and change through 180° at a height of a few kilometers. Both these abnormal types travel slowly. *Subject Heading:* **1. Cyclone theories.**—*C.E.P.B.*

3.4–129 551.515.12:551.553.5(78)

Means, Lynn L., **The midwest windstorm of October 9–10, 1949.** *Weatherwise*, 4(5):107–109, Oct. **1951.** 2 figs. **MH-BH** A description of the synoptic conditions associated with the windstorm, precipitation and deepening. *Subject Headings:* **1. Windstorms 2. Midwest United States.**

3.4–130 551.515.2:551.576.11

Frolow, S., **Observations d'un cyclone tropical en formation.** [Observations of a tropical cyclone in formation.] *La Météorologie*, 4th Ser., No. 9:66–71, Jan./March **1948.** 4 figs., photos. **DWB**- A study of the hurricane of mid-September 1945, which crossed the Antilles to Florida, by means of the successive cloud formations. These are illustrated by a series of panoramic photos from Fort de France, showing convergence of cloud lines at a point 350 km to the north. *Subject Headings:* **1. Hurricanes 2. Cloud formations.**—*C.E.P.B.*

3.4–131 551.515.2

Takahashi, K., Watanabe, T., Kubota, S., Ando, T. and Nakamura, N., **The structure and the energy of typhoons.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(3):69–86, March **1951.** 14 figs., 4 tables, numerous equations. In English, Japanese summary p. 86. **MH-BH** -A summary of authors' studies. It opens with a study by S. KUBOTA of the tropical low pressure of S. coast of Japan in Aug. 1950, and the "midget" typhoons superposed on it. WATANABE discusses dynamics of eye of typhoon, and the relation between the wind center and pressure center, TAKAHASHI and ITO the distribution of surface wind velocity. NAKAMURA calculated the motion of air particles and TAKAHASHI derived semitheoretical formulas fo

estimating the various components of energy of a typhoon. Kinetic energy and energy of pressure are calculated for 7 typhoons; ANDO worked out in greater detail Kitty and Kezia typhoons. Finally, TAKAHASHI gives two formulas relating number of houses destroyed and fatalities to central pressure, radius and time. *Subject Headings:* **1. Typhoons 2. Typhoon structure.**—*C.E.P.B.*

3.4–132 551.515.2

Visser, S. W., **Typhoon of Taifoen?** [Typhoon or Taifoen?] *Hemel en Dampkring*, 48(12):214, Dec. **1950.** 3 refs. **DLC**—The Dutch spelling typhoon leads to its pronunciation as a Greek work "tiefoon." This pronunciation is regarded as wrong by Chinese scholars since the word is from the Chinese "tai foeng." The possibility that typhoon is of Greek origin is considered. It is suggested that typhoon be pronounced as in English and written as "taifoen." *Subject Headings:* **1. Typhoons 2. Etymology.**—*I.L.D.*

3.4–133 551.515.21(52)

Kamiko, T., **The distribution of vertical instability in the neighborhood in tropical cyclones.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(6):194-198, June **1951.** 11 figs., 7 equations. In Japanese, English summary p. 198. **MH-BH**—Author calculated the distribution of vertical latent instability over Japan from aerological data of temperature and humidity during approach of typhoons. He found maxima of instability in the periphery of storms and in the direction of motion. *Subject Headings:* **1. Typhoon structure 2. Instability 3. Japan.**—*C.E.P.B.*

3.4–134 551.515.21:551.465

Kawabata, Y. and Fujito, M., **Elevation of the sea surface caused by typhoons.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(2):37–44, Feb. **1951.** 5 figs., table. In English, Japanese summary p. 43. **MH-BH**—Rise of water level is made up of suction by low pressure, wind drift, etc. Times of highest water in relation to lowest pressure are examined for a number of typhoons and it is found that the maximum generally occurs when typhoon center is nearest. A prediction diagram is given for minimum height of high water level. *Subject Heading:* **1. Storm tides.**—*C.E.P.B.*

3.4–135 551.515.21

Kleinschmidt, Ernst, Jr., **Grundlagen einer Theorie der tropischen Zyklonen.** [Basis of a theory of tropical cyclones.] *Archiv für Meteorologie, Geophysik und Bioclimatologie, Ser. A*, 4:53-72, **1951.** 3 figs., 16 refs., 53 equations. German, English and French summaries p. 53–54. **DWB**—In developing tropical cyclones, air flows inwards near the sea due to friction and outwards in the middle troposphere. The boundary is determined by the temperature excess in the central region, which excess therefore cannot exceed a moderate value. The initial conditions in which a cyclone can develop are shown in a diagram. Two possible causes are considered: masses with a high value of ERTEL's Z in the trade overlain by weak Z, and nonadiabatic processes associated with shower activity. Author then constructs a model of a fully developed moderate cyclone, showing moist potential isotherms, gradient winds and air circulation. The energy balance of a cyclone and characteristics of the eye are discussed quantitatively. *Subject Heading:* **1. Tropical cyclones.** –*C.E.P.B.*

3.4–136 551.515.21(52)

Watanabe, T., **Dynamical study of the eye of a typhoon.** *Journal of Meteorological Research*, Tokyo, 3(5):151–156, March **1951.** 3 figs., equations. In Japanese, English summary p. (11). **DWB**—The motion of an air particle in a stationary circular pressure field is determined by the law of conservation of absolute angular momentum and energy. It is shown by means of diagrams that a convergence circle gradually increases in size. The characteristics of the circle are discussed in terms of vertical current, latitude and surface friction. It is concluded that the convergence circle corresponds to the eye of the typhoon. *Subject Heading:* **1. Hurricane dynamics.**

3.4–137 551.515.23:551.511

Burgner, Newton M., **The movement of hurricanes.** *Weatherwise*, 4(5):102–105, Oct. 1951. 3 figs. **MH-BH**—The author reviews briefly the various explanations for the external forces (steering level, etc.) and the internal forces (northward displacement approximately proportional to storm intensity, westward displacement which decreases in relation to the northward movement and periodic displacement of small amplitude about the mean track). *Subject Headings:* **1. Hurricane tracks 2. Hurricane dynamics.**—*I.L.D.*

3.4–138 551.515.23

§Haurwitz, Bernhard, **The motion of binary tropical cyclones.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 4:73–86, 1951. 3 figs., table, 4 refs., 9 equations. English, German and French summaries p. 73. **DWB**—It is often observed that two adjacent tropical cyclones rotate counterclockwise round each other. The author discusses this motion assuming a binary Rankine vortex and obtains an equation from which the rate of rotation can be computed. Computed and observed rotations for 32 binaries 1900–1938 show little agreement but this is attributed to inaccurate data. Nine recent cases give much better agreement. *Subject Heading:* **1. Tropical cyclones.**—*C.E.P.B.*

3.4–139 551.515.41:551.511:551.558

Koschmieder, Harald, **Zur kinematischen Theorie der Linienböe.** [On the kinematic theory of the line squall.] *Annalen der Meteorologie*, 4(1–6):115–122, 1951. 8 figs., 10 refs. German and English summaries p. 115. **MH-BH**—A stationary two-dimensional model of a squall with a growing squall cloud is constructed with two lateral eddies at different heights. This is compared with various other models and with observations, including the Thunderstorm Project. Good discussion by K. Schneider-Carius, H. Wichmann, P. Raethjen. *Subject Headings:* **1. Thunderstorm structure 2. Line squalls.**—*C.E.P.B.*

3.4–140 551.515.7:551.509.33

Baur, Franz, **Zum Problem der Entstehung und Voraussage von Hochdrucklagen.** [On the problem of the origin and forecasting of anticyclones.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 4:272–295, 1951. 2 figs., 5 tables, 11 refs. German, English and French summaries p. 272–273. **DWB**—On theoretical grounds (reduction of energy) author adopted the working hypothesis that cooling over a large area favors development of high pressure. He found that 67% of cases of pressure 1020 mb or more for 5 days at Potsdam were preceded by a total fall of temperature exceeding 3.5°C in 6 days. With a total fall of 7.3°C and some other factors, percentage rose to 100. *Subject Headings:* **1. Anticyclones 2. Extended forecasting.**—*C.E.P.B.*

3.4–141 551.515.8(73)

§Carr, J. A., **The East Coast "backdoor" front of May 16–20, 1951.** *Monthly Weather Review*, 79(5):100–105, May 1951. 14 figs. **DWB**—A brief heat wave occurred over the North Atlantic States in the middle of May 1951. The wave was broken by a semistagnant high over the region east of the Appalachian Mountains extending south to Florida. A detailed case history is presented, with surface 700 mb and adiabatic charts and cross sections for May 16–20, 1951, and a discussion of the development and degeneration of the system. *Subject Headings:* **1. Cold fronts 2. Blocking action 3. North Atlantic States.**—*M.R.*

RADIATION AND TEMPERATURE

RADIATION

(*See also items:* 3.4–5, 3.4–31, 3.4–57)

3.4–142 551.521(436)

Eckel, O., **Ergebnisse von Strahlungsmessungen auf dem Sonnblick.** [Results of radiation measurements on the Sonnblick.] *Wetter und Leben*, 3(8):170–174, Aug. 1951. fig., 4 tables. **MH-BH**—Tables give for Oct. 1934–March 1935 direct solar radiation (total and with various filters); total sun and sky radiation on clear days increased from 12% on

March 12 to 25% Dec. 24. The effect of cloudiness is illustrated. *Subject Headings:* **1. Radiation data 2. Sonnblick, Austria.**—*C.E.P.B.*

3.4–143 551.521(234)

Steinhauser, Ferdinand, **Über die Abhängigkeit der Sonnen- und Himmelsstrahlung von der Höhe in den Ostalpen.** [On the dependence of solar and sky radiation on height in the eastern Alps.] *Annalen der Meteorologie*, 4(1–6):109–114, **1951.** 5 figs., 4 tables, 7 refs. **MH-BH**—Author calculates average values of radiation on a surface normal to the sun and sky radiation on clear and cloudless days for sun heights 10–60° for altitudes 200–3000 m, and relation of sky radiation to cloudiness for eastern Alps. *Subject Headings:* **1. Radiation 2. Orographic influences 3. Alps.**—*C.E.P.B.*

3.4–144 551.521.1

Schulze, Rudolf, **Zur Abhängigkeit des Globalstrahlenspektrums von der Sonnenhöhe.** [On the dependence of the global radiation spectrum on the sun's height.] *Annalen der Meteorologie*, 4(1–6):176–182, **1951.** 11 fig., table, 3 refs. German and English summaries p. 176. **MH-BH**—The calculation of the variation of spectral distribution with sun's height is briefly set out. An instrument with a flattened spherical receiver, which combined with filters and selenium photo elements gave measurements of radiation covering the spectral range from about 0.3 to 0.8μ is described. The results for different wave lengths are compared with calculated values (agreement good above 0.35μ) showing tnat in spectral regions free from absorption the variation of radiation with sun's altitude is only about 10%. *Subject Headings:* **1. Radiation calculations 2. Radiation instruments.**—*C.E.P.B.*

3.4–145 551.521.11:551.589.1

Maede, Hans and Matzke, H., **Wetterlagenbedingte oder spezifische Sonnenscheindauer in Greifswald.** [Sunshine duration caused by weather types or specific sunshine duration in Greifswald.] *Zeitschrift für Meteorologie*, 5(10):304–312, Oct. **1951.** fig., 4 tables, 10 refs. **MH-BH**—Daily sunshine durations at Greifswald 1931–1950 were classified according to weather type. Monthly means are tabulated and the results analyzed. Figure shows annual variation of sunshine with unsettled, cyclonic and anticyclonic groups of types compared with possible and mean values. *Subject Headings:* **1. Sunshine duration 2. Weather types 3. Greifswald, Germany.**—*C.E.P.B.*

3.4–146 551.521.11

Matzke, H. and Reinhard, H., **Die Sonnenscheindauer in Greifswald.** [Sunshine duration in Greifswald.] *Zeitschrift für Meteorologie*, 4(11):330–336, Nov. **1950.** 3 figs., 3 tables, 19 refs. **MH-BH**—Records of a Campbell-Stokes sunshine recorder 1931–50 are summarized by months, days and hours. The frequencies of daily amounts and percentages of possible are illustrated. The peculiarities of the diurnal variation are discussed. For the year percentages of sunshine and cloud add up to 99 but this does not hold for individual months. *Subject Headings:* **1. Sunshine duration 2. Greifswald, Germany.**—*C.E.P.B.*

3.4–147 551.521.13

Georgi, Johannes, **Prüfung der Solarkonstanten.** [Test of solar constant.] *Meteorologische Rundschau*, 4(9–10):193–194, Sept.–Oct. **1951.** **MH-BH**—A discussion of the "agreed" solar constant determined by LANGLEY and ABBOT between 1.92±.02 and K. WEGENER's "astronomical" solar constant of 2.4, favoring the former. *Subject Heading:* **1. Solar constant.**—*C.E.P.B.*

3.4–148 551.521.3:551.576.1

Atkins, W. R. G., **The relation between thickness of cloud layers and their transmission of light.** *Royal Meteorological Society, Quarterly Journal*, 77(334):659–662, Oct. **1951.** 6 figs., table, 9 refs. **MH-BH**—Minimum illuminations at ground level on cloudy days during flights at Bircham Newton were expressed as percentages of illumination on cloudless days and plotted against cloud thickness. The results are tabulated and discussed in terms of cloud type and thickness. *Subject Headings:* **1. Atmospheric absorption 2. Daylight illumination.**—*C.E.P.B.*

3.4–149 551.521.32 551.509.33

Albrecht, Fritz H. W., **Heat economy and long range forecasting of the weather.** *Weather Development and Research Bulletin*, Melbourne, No. 17:9–32, Aug. 1951. graphs, charts, 31 refs. **DWB**—The general concepts of heat balance, evaporation from oceans, continentality, ocean currents, trade winds, height of troposphere, etc. are outlined on the basis of the author's theory that all of these factors are controlled by the release of latent heat from precipitation, which is greater in the tropics than in the polar regions. Monthly charts (Feb. and Aug.) for the Pacific and Indian Ocean regions are presented, showing precipitation, evaporation and heat balance in some detail. Charts for the Atlantic and continental areas are also included. The importance for long range forecasting of monthly charts of heat exchange, of a network of stations to measure the heat balance in all parts of the earth, including automatic stations in remote areas, is stressed. *Subject Headings:* **1. Energy exchange 2. Long range forecasting 3. Heat balance 4. Ocean regions.**—*M.R.*

3.4–150 551.521.63:581.036

von Denffer, Dietrich and Schlitt, Liesellore, **Blühförderung durch Ultravioletttstrahlung.** [Hastening of flowering by UV radiation.] *Naturwissenschaften*, 38(24):564–565, Dec., 1951. fig., 2 refs. **DWB**—To test theory that UV radiation favors early blooming of mountain plants, numerous species were exposed to artificial UV rays. Short exposures accelerated blooming, longer ones inhibited it. *Subject Headings:* **1. Phenology 2. Ultraviolet radiation.**—*C.E.P.B.*

TEMPERATURE

(*See also items:* 3.4–72, 3.4–100, 3.4–106)

3.4–151 551.524:551.311.182

Assur, A., **Über das Dickenwachstum des Eises.** [On the growth of thickness of ice.] *Deutsche Hydrographische Zeitschrift*, 4(1/2):72–74, 1951. 6 refs., 3 equations. English and French summaries p. 74. **DWB**—Value of 0.002 used by F. Model (1948) for heat conductivity of ice is too small; author adopts 0.0055 and obtains $h = 3.60\sqrt{S}$ where S is sum of negative daily mean temperatures. This thickness is never reached owing to snow cover and a reduction factor is estimated. *Subject Headings:* **1. Temperature effects 2. Ice accretion.**—*C.E.P.B.*

3.4–152 551.524

Fontseré y Riba, Eduardo, **L'anomalia tèrmica de la Plana de Vic.** [Thermal anomaly in the Plana de Vic.] *Catalonia, Servei Meteorològic, Memòries*, 1(1), **1937.** 40 p. 15 diagrs., 31 tables, refs. In Catalan, French summary p. 40. **DWB**—An analytical, statistical study based on records at Fabra Observatory and at Vilatorta, Spain. Local variations in temperature due to orographic or maritime influences on the Catalan coast are discussed from a micrometeorological point of view. Incidence of frost, low night time temperatures, etc. are treated in detail. Variations in mean and extreme shelter temperatures shown by means of numerous scatter diagrams. Exposure of instruments described and illustrated. *Subject Headings:* **1. Temperature variations 2. Catalan language 3. Catalonia, Spain.**—*M.R.*

3.4–153 551.524:551.311.181(43)

Prahm, Gertrud, **Die Abschmelzzeit des Eises an den deutschen Küsten zwischen Ems und Oder.** [The melting time of the ice on the German coasts between Ems and Oder.] *Deutsche Hydrographische Zeitschrift*, 4(1–2):17–28, 1951. 2 charts, 4 tables, 12 refs. Summary in German, English, French p. 17–18. **DWB**—"Melting time" is defined as the number of successive days with mean air temperature above 0°C after thaw has set in until last ice has gone. This is calculated for a number of places for normal and icy winters. Means are: North Sea, normal 2.7 days, icy 6.1; Baltic 3.5, 9.9. The results are shown on 2 charts and their climatic and hydrographic relations discussed. *Subject Headings:* **1. Sea ice melting 2. Temperature effects 3. German Coasts.**—*C.E.P.B.*

3.4–154 551.524.1

Crain, C. M. and Gerhardt, J. R., **On a new method for the study of atmospheric turbulence near the earth's surface.** *Journal of Meteorology*, 8(5):363–365, Oct. 1951. 2 figs., 5

refs. **MH-BH**—Authors recorded short-period fluctuations of temperature difference between thermistors 3 ft. above ground, simultaneously at distances $s = 1$ to 85 inches. The root-mean-square values of the fluctuations °C are fitted by $0.84(1-e^{s/33})$. *Subject Headings:* **1. Temperature microvariations 2. Atmospheric turbulence.**—*C.E.P.B.*

3.4–155 551.524.1:551.551

Panofsky, H. A., **A preliminary analysis of the vertical heat flux at five meters over water.** Woods Hole Oceanographic Institution, Marine Meteorology, Contract N6 onr-27702, Project NR-082-021, Technical Report No. 13, Sept. 1951. 15 p. 5 tables, 7 refs., 5 equations. **DWB**—A crude spectral analysis of heat flux has been carried out on the basis of observations of vertical velocity and temperature at 5 m elevation, which were available for a number of periods and each of which lasted 4 to 5 minutes. The following tentative conclusions were obtained: 1) "The sign and magnitude of the heat flux measured at Woods Hole at 5 m elevation are reliable under unstable conditions only." 2) "Up to 25% of the kinetic energy under stable conditions and about 15% under unstable conditions lies at a frequency too high to be measured with existing instruments." 3) "Maximum kinetic energy occurs at higher frequencies than maximum kinetic flux." *Subject Headings:* **1. Turbulent exchange 2. Heat exchange 3. Temperature microvariations. I. Woods Hole Oceanographic Institution II. Contract N6 onr-27702, Project NR-082-021.**—*I.L.D.*

3.4–156 551.524.31

Brooks, Charles F., **Interdiurnal variability of temperature extremes.** *American Meteorological Society, Bulletin*, 32(5):192, May 1951. **MH-BH**—The interdiurnal variability in January exceeding 10°F observed in northern Vermont and adjoining New York is attributed to the alternation of clear and cloudy nights over a snow cover. *Subject Heading:* **1. Interdiurnal temperature variations.**—*I.L.D.*

3.4–157 551.524.33

Lewis, William, **On a seven-day periodicity.** *American Meteorological Society, Bulletin*, 32(5):192, May 1951. table. **MH-BH**—The free air temperature data for March, April and May for the period 1938 through 1942 at Chicago, Joliet and Bismarck, were treated statistically according to the procedure suggested by Dr. Langmuir. The results indicate that, using the criterion of significance established by Dr. Langmuir, seven day periodicities were found in 2 of the 5 spring seasons examined. *Subject Heading:* **1. Temperature periodicities.**—*I.L.D.*

3.4–158 551.524.35:631

Hänsel, Hermann, **Über die Wirkung wechselnder Temperaturen auf Wachstum und Entwicklung einiger Pflanzen (Übersicht).** [On the effect of variable temperatures on the growth of certain plants (summary).] *Wetter und Leben*, 3(8):161–166, Aug. 1951. 2 figs., 18 refs. **MH-BH**—Summarizes work of Sachs (1860), Blaaw, etc. on limiting and optimum temperatures of germination and growth stages of various plants, and of several authors on combined effect of changes of temperature with light and darkness (thermoperiodicity acc. Went). Optimum temperature is higher by day than night; this is related to breathing and assimilation. Vernalization is briefly discussed. *Subject Headings:* **1. Temperature variations 2. Plant ecology.**—*C.E.P.B.*

3.4–159 551.524.36(42)

King, M. B., **A comparison of the daily extremes of temperature at two stations in a Chiltern dry valley.** *Royal Meteorological Society, Quarterly Journal*, 78(335):102–103, Jan. 1952. fig., 2 tables. **DWB**—Observations at station in narrow part of valley and at one 1.2 miles higher up and more open are tabulated by months. Greatest diurnal range 52.1°F at lower station, 47.5 at higher. *Subject Headings:* **1. Temperature microvariations 2. Chiltern, England.**—*C.E.P.B.*

3.4–160 551.524.4

Baum, Werner A., **Note on the theory of super-autoconvective lapse rates near the ground.** *Journal of Meteorology*, 8(3):196–198, June 1951. 7 figs., 7 equations. **DWB**—

RAYLEIGH's work on the stability of thin fluid sheets heated from below is applied to the problem of the existence of super-autoconvective lapse rates near the ground. By substituting eddy viscosity and eddy conductivity coefficients for molecular viscosity and molecular conductivity coefficients in RAYLEIGH's equation and from the equation of state and the hydrostatic equation, the following inequality is attained:

$$-\frac{\delta T}{\delta Z} < \gamma + \frac{27\pi^4 K \eta T}{4pg(\Delta z)^4}$$

γ—autoconvective lapse rate
T—temperature
K—eddy conductivity coefficient
η—eddy viscosity coefficient. *Subject Heading:* **1. Vertical temperature gradient.**—*I.L.D.*

PRESSURE AND WIND

PRESSURE

(*See also items:* 3.4–62, 3.4–64, 3.4–72, 3.4–112, 3.4–162)

3.4–161 551.543:551.594.7:550.385

Beynon, W. J. G. and Brown, G. M., **Geophysical and meteorological changes in the period January–April 1949.** *Nature*, London, 167(4260):1012–1014, June 23, 1951. 3 figs., 5 refs. **DWB**—Summarizes unusually close relations between daily noon atmospheric pressure at Kew, deviations from monthly mean curve of daily noon values of vertical incidence critical frequencies of normal region E and region F2, and daily K index of geomagnetic activity at Abinger. *Subject Headings:* **1. Atmospheric pressure 2. Magnetic storms 3. Kew, England.** —*C.E.P.B.*

3.4–162 551.543.1/2 551.547.3

†Klein, William W., **A hemispheric study of daily pressure variability at sea level and aloft.** U. S. Weather Bureau, Extended Forecast Section, March 1951. 33 p. 19 figs., table, 51 refs. Typewritten. **DWB**—A valuable paper which combines the results of the more important investigations (1910–1950) of pressure variations in the Northern Hemisphere. Data relating to the autocorrelation, interdiurnal variability and the standard deviation of pressure are summarized and analyzed. The 19 figures appended give, for all or most of the Northern Hemisphere except as noted below, the following parameters: 1, 2) one-day lag autocorrelation coefficient for sea level pressure, r winter and summer; 3, 4) standard deviation of interdiurnal pressure change for sea level, $\sigma\Delta p$, winter and summer; 5, 6) standard deviation of daily pressure for sea level, σp, summer and winter; 7) latitudinal average for sea level pressure from 50°E westward to 160°W for winter and summer; 8) r_1, annual average for 700 mb height and 3 km pressure; 9) same for 500 mb height and 5–6 km pressure; 10) same for 300 mb height and 9–10 km pressure; 11) $\sigma\Delta p$, annual average at 3 km (North America only); 12) same at 6 km; 13) same at 9–10 km (North America only); 14) σp, annual average at 3 km; 15) same at 6 km (North America only); 16) same at 9–10 km (North America only); 17, 18, 19) r_1, $\sigma\Delta p$ and σp in relation to latitude and elevation (North America only). *Subject Headings:* **1. Pressure variations 2. Upper air pressures. I. U. S. Weather Bureau. Extended Forecast Section.** —*R.S.Q.*

3.4–163 551.543.5:519.241.6

Nagao, T., **Standard deviation of monthly mean pressure.** *Journal of Meteorological Research*, Tokyo, 3(11):401–416, Sept. 1951. 6 figs., in Japanese, English summary p. (24). **MH-BH**—Author calculated standard deviation of monthly mean pressure for each month over Japan and neighborhood and in less detail over whole Northern Hemisphere. Isopleths are drawn over mean monthly pressure maps. Increase with latitude is studied and maps corrected for latitude drawn for North Pacific. *Subject Headings:* **1. Pressure variations 2. Statistical studies.**—*C.E.P.B.*

TURBULENCE

(*See also item:* 3.4–155)

3.4–164 551.551:551.511

Charnock, H., **Note on eddy diffusion in the atmosphere between one and two kilometres** *Royal Meteorological Society, Quarterly Journal,* 77(334):654–658, Oct. **1951.** 3 figs., table, 7 refs., 2 equations. **MH-BH**—Pairs of smoke puffs released from an aircraft were tracked by camera obscura to give information on eddy diffusion between 1–2 km height. The results are tabulated and compared with predictions by the KOLMOGOROV similarity hypothesis. Good agreement was found in light winds; in stronger winds the results were more scattered. *Subject Headings:* **1. Eddy diffusion 2. Kolmogorov similarity hypothesis.**—*C.E.P.B.*

3.4–165 551.551:533.16:532.59

Francis, J. R. D., **The aerodynamic drag of a free water surface.** *Royal Society of London, Proceedings, Ser. A,* 206:387–406, **1951.** 11 figs., 4 tables, 23 refs. **DWB**—Drag on a water surface was measured in a wind tunnel 7 m long with winds up to 14 m/s. Shear-stress coefficient increases nearly linearly with wind speed. Mean wave height, period and length were measured but the scale laws are not known. Speed of waves in relation to length agreed with Kelvin waves at low wind speeds but was greater at higher speeds. Shear-stream was measured by slope of mean water level; the small range compared with range of wave size suggests that friction is due to the small ripples superposed on main wave profile. Variation of wind speed with height above mean water level showed kinks around 8 cm above wave crests. A linear relation was found between surface speed of water and $\sqrt{}$ (shear-stress). *Subject Headings:* **1. Aerodynamics 2. Wave motion 3. Wind tunnel experiments.**—*C.E.P.B.*

3.4–166 551.551

Frenkiel, F. N., **Frequency distributions of velocities in turbulent flow.** *Journal of Meteorology,* 8(5):316–320, Oct. **1951.** 5 figs., 21 equations, 9 refs. **MH-BH**—A pressure-tube, cup or hot wire anemometer gives only the horizontal component of a turbulent wind. The relations between the frequency distributions of these and of the turbulent components parallel to the mean velocity are calculated for various ratios of fluctuations across and along wind, assuming small correlation between these (nonisentropic as well as isentropic turbulence). Two experimental frequency distributions with cup anemometers 24 and 100 ft above ground agree with the calculated distributions and are used to find the mean velocity and intensity of turbulence. *Subject Heading:* **1. Turbulence spectrum.**—*C.E.P.B.*

3.4–167 551.551

Ichiye, Takashi, **Some remarks on Richardson's neighbour diffusion equation.** *Oceanographical Magazine,* Tokyo, 2(3):101–104, Sept. **1950.** fig., 4 refs., 20 equations. **MH-BH**—The application of Richardson's diffusion equation to diffusion on the ocean is analyzed mathematically. *Subject Headings:* **1. Turbulent exchange 2. Eddy diffusion 3. Richardson's diffusion equation.**

3.4–168 551.551:533.6

Kampé de Fériet, J., **Averaging processes and Reynolds equations in atmospheric turbulence.** *Journal of Meteorology,* 8(5):358–361, Oct. **1951.** 20 equations, 9 refs. **MH-BH**—Four axioms assumed by REYNOLDS in deriving his equations for turbulent flow are discussed and it is shown that they can probably be satisfied by averaging only eddies of a given diameter (imposed by the instrument used in measurement), smaller eddies remaining unknown. *Subject Heading:* **1. Turbulence theory.**—*C.E.P.B.*

3.4–169 551.551

Neumann, Gerhard, **Gibt es eine "kritische Windgeschwindigkeit" für die Grenzfläche Wasser-Luft?** [Is there a "critical wind velocity" for the boundary surface water-air?] *Deutsche Hydrographische Zeitschrift,* 4(1–2):6–13, **1951.** 3 figs., 2 tables, 11 refs. German, English and French summaries p. 6–7. **DWB**—American investigators assume that with wind velocities under 6 m/s a water surface is aerodynamically smooth, above that rough, causing a

discontinuity in the wind profile. This is not shown by observations over inland waters, where coefficient of friction is given by $9 \times 10^{-3}/v$. Author relates discrepancy to the breakdown of the logarithmic law very near the surface because of different vertical variation above wave crests and troughs, so that extrapolation leads to error. He derives new reduction factors for a wind of 3 m/s at 100 cm above wave crests. The effects of corrections using different assumptions all point to a friction greater than that calculated directly from the observations. He infers that the supposed discontinuity at 6–7 m/s does not exist. *Subject Headings:* **1. Turbulent exchange 2. Wind profiles.**—*C.E.P.B.*

WIND

(*See also items:* 3.4–37, 3.4–106, 3.4–120, 3.4–121, 3.4–124, 3.4–125, 3.4–129, 3.4–139, 3.4–180, 3.4–193, 3.4–195)

3.4–170 551.553.11:551.571.31

Karapiperis, Photios P., **The diurnal march of vapour pressure on sea-breeze days at Athens, Greece.** *Royal Meteorological Society, Quarterly Journal*, 78(335):82–84, Jan. 1952. 2 figs., 5 refs. **DWB**—Sea breeze occurs in Athens on quiet days especially in May, June and Oct. Normal diurnal variation of vapor pressure is a double wave, maxima 7 hr and 21 hr, deep minimum at 14 hr, but on sea breeze days a third maximum appears at 11 hr and evening rise is steeper. Explanation given. *Subject Headings:* **1. Sea breezes 2. Vapor pressure 3. Athens, Greece.**—*C.E.P.B.*

3.4–171 551.553.12:551.509.34

Snyder, Hugh C., **Forecasting the weather. A statistical study of drainage winds at Denver, Colorado.** *Weatherwise*, 4(5):115–117, Oct. 1951. 2 figs., 2 tables. **MH-BH**—Criteria for defining drainage winds at Denver. *Subject Headings:* **1. Drainage winds 2. Denver, Colorado.**

3.4–172 551.554

Björgum, O., **Note on the derivation of the logarithmic velocity profile.** *Royal Meteorological Society, Quarterly Journal*, 78(335):89–90, Jan. 1952. 3 refs., 6 equations. **DWB**—Author shows that with neutral equilibrium over smooth ground the power law of vertical variation of velocity cannot apply in a fully turbulent surface layer of air, and he derives the logarithmic law. *Subject Heading:* **1. Wind profiles.**—*C.E.P.B.*

3.4–173 551.555.4

Voigts, Heinrich, **Experimentelle Untersuchungen über den Kaltluftfluss in Bodennähe bei verschiedenen Neigungen und verschiedenen Hindernissen.** [Experimental investigations into the flow of cold air near the ground with different slopes and obstacles.] *Meteorologische Rundschau*, 4(9–10):185–188, Sept.–Oct. 1951. 2 figs., 4 refs. **MH-BH**—After summarizing previous observations, author describes a model slope at the head of which air was cooled by liquid oxygen and speed of flow measured with different slopes over wood, sand and grass. Ratios of mean flows agreed with REIHER's formula (1936). Results are discussed. *Subject Heading:* **1. Katabatic winds.**—*C.E.P.B.*

3.4–174 551.555.9:523.74

Karapiperis, Leonidas N., **On the periodicity of the etesians in Athens.** *Weather*, 6(12):378–379, Dec. 1951. fig. **DWB**—Frequency of Etesian winds 1893–1937 shows a correlation of +0.63 with sunspot numbers. *Subject Headings:* **1. Etesian winds 2. Sunspot effects 3. Athens, Greece.**—*C.E.P.B.*

3.4–175 551.555.9

§Scorer, R. S., **Mountain-gap winds; a study of surface wind at Gibraltar.** *Royal Meteorological Society, Quarterly Journal*, 78(335):53–61, Jan. 1952. 10 figs., 5 tables. **DWB**—In stable situations air flows horizontally through the gap towards lower pressure, emerging as a jet with eddies. Flow from a pool of cold air is illustrated by charts and upper air data of March 17–19 and Jan. 23, 1944. For other cases, upper winds show effect of changes in

pressure distribution and stability. Some "capricious" reversals are discussed. *Subject Headings:* **1. Local winds 2. Topographic effects 3. Gibraltar.**—*C.E.P.B.*

3.4–176 551.556.2

Rider, N. E., **The effect of a hedge on the flow of air.** *Royal Meteorological Society, Quarterly Journal,* 78(335):97–101, Jan. 1952. 4 figs., 2 tables, 2 refs. **DWB**—Twelve cup anemometers were exposed at ½, 1 and 2 m at various distances up- and downwind from a hedge 1.68 m high. Ratios to free wind shown in graphs and tables. Free wind at 2 m was reduced up to 15 hedge heights upwind and 60 downwind. At 1 and ½ m effects were over shorter distances. *Subject Headings:* **1. Wind protection 2. Windbreaks.**—*C.E.P.B.*

3.4–177 551.556.2:63

Wendt, H., **Der Einfluss der Hecken auf den landwirtschaftlichen Ertrag.** [The influence of hedges on the agricultural yield.] *Erdkunde,* Bonn, 5(2):115–125, **1951.** 10 figs., 11 tables, 15 refs. **DLC**—Hedges as windbreaks decrease evaporation and runoff and collect dew, so raising soil moisture. They raise soil temperature, but may lengthen period of snow cover. On the whole, the effect is to increase crops more than enough to compensate for loss of crop space. Many examples are given and some generalized curves and tables are constructed to show relation between number of windbreaks per hectare or distance apart, "climatic damage factor" and yield of various crops. Some practical considerations are discussed. Papers by W. TISCHLER on "Hedges as habitat for plants and animals with special reference to their damage" (p. 125–132), W. HARTKE, "The hedge landscape" (p. 132–152) and C. TROLL "Hedge landscapes in the maritime green belt and in Central European provinces" (p. 152–157) follow. *Subject Headings:* **1. Windbreaks 2. Microclimatology 3. Crop yield. I. Tischler, W. II. Hartke, W. III. Troll, Carl.**—*C.E.P.B.*

3.4–178 551.556.4:632.7

Kennedy, J. S., **The migration of the desert locust (*Schistocerca gregaria* Forsk). I. The behaviour of swarms. II. A theory of long-range migrations.** *Royal Society of London, Philosophical Transactions, Ser. B,* 235(625):163–290, May 31, **1951.** 14 figs., 8 tables, 147 refs. **DWB**—Observations of swarms in Arabia, Iran and Kenya 1942–44 are analyzed. Reactions of flight to condition of locusts, wind speed and direction and gustiness are discussed at length and the shearing effect on a swarm of a wind increasing with height is explained. Effect of high air temperature in inducing rest is mentioned. In Pt. II cartographical analysis of migrations is related to conflict between locust controlled and wind controlled displacements, modified by temperature and gustiness and availability of breeding grounds, giving a fairly regular pattern of seasonal distribution. *Subject Headings:* **1. Wind effects 2. Insect migration 3. Locusts.**—*C.E.P.B.*

3.4–179 551.556.4:632.7

Rainey, R. C., **Weather and the movements of locust swarms: a new hypothesis.** *Nature,* London, 168(4286):1057–1060, Dec. 22, **1951.** 2 figs., 31 refs. **DLC**—Locust migrations are generally downwind, and when against prevailing wind occur during temporary wind reversals. They are thus from areas of wind divergence to areas of convergence and swarms collect near the latter, usually the intertropical convergence zone. This is illustrated by distribution of swarms in Africa and India, July 12–31, 1950 (stationary zone) and northeast Africa, Sept. and Oct., 1950 (zone moving S.). May be used for forecasting swarms and explains frequent arrival of swarms with heavy rain. *Subject Headings:* **1. Wind effects 2. Locusts 3. Insect migration.**—*C.E.P.B.*

AQUEOUS VAPOR AND HYDROMETEORS

EVAPORATION

(*See also items:* 3.4–1, 3.4–2, 3.4–46, 3.4–170, 3.4–235)

3.4–180 551.573:551.558.29

Möller, Fritz, **Bestimmung der Landesverdunstung durch Grossaustausch. (Vorläufige Mitteilung.)** [Determination of the regional evaporation by large scale horizontal exchange.

(Preliminary report.)] *Annalen der Meteorologie*, 4(1–6):157–160, **1951.** table, 10 refs., 4 equations. **MH-BH**—Author develops a differential equation for evaporation minus precipitation over a month or more in terms of change of water vapor and mean wind vector. These terms are calculated for a region including England, Holland, North Sea and Northwest Germany for June–Sept. 1949 and Jan.–March 1950. Results in summer (but not winter) agree with evaporation in upper Weser valley. *Subject Heading:* **1. Evaporation.** —*C.E.P.B.*

3.4–181 551.573:551.579

Reichel, Eberhard, **Die Verdunstung im Wasserkreislauf der Erde.** [Evaporation in the water circulation of the earth.] *Umschau*, Frankfurt a.M., 52(2):37–39, Jan. 15, **1952.** 4 figs. **DGS**—For land the mean annual rainfall = 670 mm, runoff 200 mm, evaporation therefore 470 mm. Various methods of finding evaporation over land and sea are summarized; that over sea calculated as 955 mm/year. Zonal rainfall, evaporation and difference over land, sea and world as a whole shown graphically and discussed. *Subject Headings:* **1. Evaporation data 2. Hydrologic cycle.**—*C.E.P.B.*

3.4–182 551.573

Spink, P. C., **Fluctuations of evaporation.** *Weather*, 7(1):32, Jan. **1952.** **DWB**—Variations of evaporation (by PICHÉ) and rainfall at Ulceby, Lincolnshire, 1949–51. *Subject Heading:* **1. Evaporation.**

CLOUD PHYSICS AND ICING

(*See also items:* 3.4–68, 3.4–69, 3.4–95, 3.4–200)

3.4–183 551.574.1

aufm Kampe, H. J. and Weickmann, Helmut K., **The effectiveness of natural and artificial aerosols as freezing nuclei.** *Journal of Meteorology*, 8(5):283–288, Oct. **1951.** 3 figs., 22 refs. **MH-BH**—Ice particles per liter obtained by introducing hot steam into a cold chamber increased logarithmically from 1 at −10 to −15°C to 10^4 at −24 to −32°C. As 1–10 per liter give continuous precipitation, updrafts from ground to −12 to −15°C should suffice. This is supported by natural observations over land and sea. Seeding with AgI gave a threshold at −3 to −5°C rising steeply to 1000 ice crystals per liter. CoI almost as effective if seeded directly into cloud, but too hygroscopic for ground use. CdI less effective. Clouds suitable for seeding discussed. *Subject Headings:* **1. Freezing nuclei 2. Cloud seeding.** —*C.E.P.B.*

3.4–184 551.574.1

Best, A. C., **Effect of turbulence and condensation on drop-size distribution in cloud.** *Royal Meteorological Society, Quarterly Journal*, 78(335):28–36, Jan. **1952.** fig., table, 27 equations, 6 refs. **DWB**—The effect of coalescence of droplets in a layer cloud is examined. Equations are developed to represent rate of change of number of drops owing to condensation and coalescence, and these are evaluated numerically under various assumptions. It is found that except for large drops the increase in the number, within a given diameter range, due to condensation is much larger than that due to coalescence (which may result in a decrease). The balance between condensation and diffusion in the steady state is examined and an Incomplete Gamma function is deduced for drop size distribution, which agrees closely with an earlier empirical formula and with measured values. *Subject Heading:* **1. Drop size distribution.**—*C.E.P.B.*

3.4–185 551.574.1

Coulter, Lowell V., **The role of surface forces in water vapor adsorption on foreign nuclei.** Boston University, Contract AF19(122)-361, Report No. 1, Jan. 31, **1951.** 7 p. fig. **DWB**—An attempt is made to test the assumption that significant differences in the adsorption properties of foreign nuclei may be reflected in differences of the capacity of nuclei to bring about the formation of water droplets. The author discusses the determination of the adsorption isotherm and describes the adsorption equipment, the volumetric procedure and the

gravimetric procedure. The selection of adsorbents is discussed. *Subject Headings:* 1. Condensation nuclei 2. Adsorption of water vapor 3. Cloud physics. I. Boston University II. Contract AF 19(122)-361.—*I.L.D.*

3.4–186 551.574.1

Dingle, A. N. and Nexsen, W. E., Jr., **An observation of the freezing of droplets in ion tracks.** *Journal of Meteorology*, 8(5):365–366, Oct. 1951. 2 refs. MH-BH—In a cloud chamber with a water reservoir above a pool of cold alcohol, ion tracks scintillated, indicating freezing of water droplets at temperatures of −40 to −45°C. *Subject Heading:* 1. Freezing nuclei.—*C.E.P.B.*

3.4–187 551.574.1

Hosler, C. L., **On the crystallization of supercooled clouds.** *Journal of Meteorology*, 8(5):326–331, Oct. 1951. 2 figs., 2 tables, 15 refs. MH-BH—Freezing temperatures of droplets in a cold chamber were noted when foreign substances as vapor, spray or gas were introduced. Temperature was independent of crystal form of substance; many were inactive including CdS (hexagonal). Author argues that as surface energy of a small water droplet is increased by freezing, it can only be frozen by increasing size of droplet, decreasing temperature or adding highly polarizable molecules or ions. Since these are in solution, crystal form is unimportant. Iodine being highly polarizable, all its compounds are effective. *Subject Heading:* 1. Freezing nuclei.—*C.E.P.B.*

3.4–188 551.574.1:536.42

Mason, B. J., **The spontaneous crystallisation of supercooled water.** *Royal Meteorological Society, Quarterly Journal*, 78(335):22–27, Jan. 1952. 5 equations, 19 refs. DWB—Evaluation of TURNBULL and FISHER's expression (1949) for rate of formation of ice nuclei gives result that nucleation rate increases 9-fold for each degree of temperature fall around −40°C. In a refrigerator very few ice crystals were formed at −39°C, but below −41°C whole cloud became ice in a fraction of a second. This is attributed to freezing of spontaneously formed droplets. Iridescence of mother-of-pearl cloud at −80°C is attributed to small spheres of glassy ice, not water. *Subject Headings:* 1. Ice crystal formation 2. Nacreous clouds.—*C.E.P.B.*

3.4–189 551.574.2

Woodman, Charles A. and Langmuir, Irving, **A gamma pattern seeding of stratus clouds, flight 52 and a race track pattern seeding of stratus clouds, flight 53.** General Electric Research Laboratory, Schenectady, Contract DA-36-039-sc-15345, DA Project 3-99-07-022, Sc Project 24-172B-0, Project Cirrus, Final Report, July 30, 1951. p. 232–258. 10 figs. DWB—A detailed description of two dry ice cloud seeding flights following certain patterns on Nov. 24, 1948 near Schenectady, N. Y. is given, including weather conditions, process of flights, methods applied and results. The effect of the seedings in dispersing clouds along the course seeded, claimed to be spectacular, is shown on pictures taken after the seeding had been completed. *Subject Headings:* 1. Cloud seeding 2. Artificial cloud dispersal 3. Cloud photography 4. Dry ice 5. New York. I. General Electric Research Laboratory, Schenectady II. Contract DA-36-039-sc-15345, DA Project 3-99-07-022, Sc Project 24-172B-0.—*G.T.*

CLOUDS

(*See also items:* 3.4–68, 3.4–130, 3.4–148)

3.4–190 551.576.11

Faust, Heinrich, **Beobachtung einer Böenwolke von der Seite.** [Sideways observation of a squall cloud.] *Meteorologische Rundschau*, 4(9–10):192–193, Sept.–Oct. 1951. fig. MH-BH—Sketches show side view of a cold front cloud over Bad Kissingen. Descending cloud tongues associated with turbulence were very roughly 12 m across. *Subject Heading:* 1. Cloud structure.—*C.E.P.B.*

3.4–191 551.576.11:551.508.765:535.8

†Keily, D. P., **Measurement of drop size distribution and liquid water content of natural clouds.** *Massachusetts Institute of Technology, Dept. of Meteorology, Quarterly Progress Reports,* No. 1–3, Feb. 28, **1951.** 25 p., 2 figs., 39 refs., 39 equations. **DWB**—A review of the literature on methods of measuring drop size and total liquid water content, according to the author, does not indicate existence of any method adapted to aircraft operating at moderate speed and altitude. Possibilities of various methods based on electrical attenuation and light scattering means are examined through a theoretical approach supported by detailed calculations. Suggestions are presented as to further improvements especially of the light scattering and attenuating methods. Intensity of scattered light is represented in two graphs. *Subject Headings:* **1. Drop size distribution 2. Liquid water content of clouds 3. Scattering of light. I. Massachusetts Institute of Technology. Dept. of Meteorology.**—*G.T.*

3.4–192 551.576.11:551.577.11:551.509.3

Langwell, Patricia A., **The onset of rain from cumuli.** *Journal of Meteorology,* 8(5):354–356, Oct. **1951.** table, 6 refs., 7 equations. **MH-BH** With simple assumptions as to life-history, a method is described for forecasting the area of a cumulus from which rain will first fall (forward edge with positive wind shear, trailing edge with negative shear). *Subject Headings:* **1. Cumulus clouds 2. Rainfall forecasting.**—*C.E.P.B.*

3.4–193 551.576.11:551.558.21

Petrovič, Štefan, **Rýchly vývoj oblačnosti na horách.** [Rapid formation of clouds on mountain tops.] *Meteorologické Zprávy,* 4(5–6):128, **1950.** 3 photos attached. In Slovak. **MH-BH**—Brief note on the general weather character prevailing in the Tatra Mountains on March 21, 1950. Included are 3 photos taken at 5-minute intervals showing rapid cloud formation. *Subject Headings:* **1. Banner clouds 2. Orographic effects 3. Mountain meteorology 4. Slovak language.**—*G.T.*

3.4–194 551.576.11 551.577.11

†Steinhäusser, Hans, **Physik der Wolken.** [Physics of clouds.] *Naturwissenschaftliche Rundschau,* 4(12):505–511, Dec. **1951.** 6 figs., 10 refs. **DWB**—A summary of recent investigations, especially by FINDEISEN, on cloud physics and formation of precipitation. Discusses: the atmosphere as a colloid, condensation nuclei, stability of drops and ice particles at different relative humidities, coagulation, condensation and sublimation nuclei. He then discusses physics of precipitation from Cu and stratiform clouds and, finally, refers to the problem of artificial rain. *Subject Headings:* **1. Cloud physics 2. Precipitation formation.**—*C.E.P.B.*

3.4–195 551.576.2:551.557

Sawyer, J. S. and Hett, B., **The distribution of medium and high cloud near the jet streams.** *Meteorological Magazine,* London, 80(952):277–281, Oct. **1951.** fig., 4 tables. **MH-BH**—A statistical study of the frequency of different amounts of medium and high cloud within 400 miles of jet stream axis over British Isles in 1949 showed that Ci cloud is more frequent and extensive to right than to left of axis. Other less definite conclusions are drawn. *Subject Headings:* **1. Jet stream 2. Cloud variations 3. British Isles.** *C.E.P.B.*

PRECIPITATION

(*See also items:* 3.4–1, 3.4–2, 3.4–32, 3.4–34, 3.4–192, 3.4–194, 3.4–220, 3.4–234)

3.4–196 551.577

†Karapiperis, Leonidas N., **Ereunai epi tēs periodikotētos tōn meteōrologikon stoicheiōn en Athēnais. I. Genika brochē.** [Research on the periodicity of the meteorological elements in Athens. Pt. I. General rainfall.] *Greece, Ethnikon Asteroskopeion Athnon, Hypomnemata, Ser. II, Meteorologia,* Arith. 3, **1942.** 96 p. tables, graphs, 165 refs. **DWB**—An elaborate study of periodicities and variations in rainfall, especially in Greece, based on statistical methods similar to those used for many other parts of the earth by SHAW, C. E. P.

Brooks, Hann, Brückner, Alter, Köppen, Berlage and many others which are cited. All of the possible relationships between sunspots, lunar cycles, etc. and the rainfall data for Greece are explored. *Subject Headings:* **1. Rainfall periodicities 2. Cosmic influences 3. Greece.**—*M.R.*

3.4–197 551.577.1:621.396.9

Physics of natural rain formation. *Meteorological Magazine*, London, 80(949):191–193, July **1951.** 3 refs. **DWB**—Report of lecture at Royal Meteorological Society, April 18, 1951 by E. G. Bowen on results of radar investigations of rain falling from nonfreezing clouds and coalescence theory of raindrop formation. *Subject Headings:* **1. Rain formation 2. Rain from nonfreezing clouds 3. Radar analysis of rain. I. Bowen, E. G.**—*C.E.P.B.*

3.4–198 551.577.11

Langmuir, Irving, **Cause and effect versus probability in shower production.** General Electric Research Laboratory, Schenectady, Project Cirrus, Final Report, July 30, **1951.** p. 228–231. 3 equations. **DWB**—Author claims it is wrong to assume—as the Weather Bureau does—that showers in regions such as New Mexico during the summer are directly caused by the synoptic situation. Shower formations in New Mexico are classified as "divergent phenomena" subject to the law of probability rather than to relations of cause and effect. The synoptic situation is said to be important only insofar as it determines the probability of rainfall. The Boltzman equation covering the probability of the evaporation of a molecule is applied to the probability that a shower will occur. *Subject Headings:* **1. Rainfall probability 2. Artificial precipitation. I. General Electric Research Laboratory, Schenectady II. Contract DA-36-039-15345, DA Project 3-99-022, Sc Project 24-172B-0.**—*G.T.*

3.4–199 551.577.2:551.506.3(437)

Čermáková, Marie, **Srážy ve velké Praze.** [Precipitation in Prague and suburbs.] *Meteorologické Zprávy*, 4(5–6):116–119, **1950.** 2 figs. In Czech. **MH-BH**—Location and height above sea level of 25 stations in Prague and the deviation of their mean precipitation values from the overall average are shown on two charts. Statistical conclusions are drawn regarding distribution of means and extremes in time and space. Case histories are given. Long period yearly average of total precipitation for the whole city is put at about 500 mm. The statistical data are based on records of the last 40 years but it is pointed out that precipitation was first measured in 1752 and continuous records for the Klementin Observatory exist since 1804. *Subject Headings:* **1. Precipitation distribution 2. Long period records 3. Prague, Czechoslovakia.**—*G.T*

3.4–200 551.577.21 551.577.32

*Möller, Fritz, **Vierteljahrskarten des Niederschlags für die ganze Erde.** [Quarterly charts of rainfall for the whole earth.] *Petermanns Geographische Mitteilungen*, 95(1):1–7, **1951.** 2 figs., folding chart, 3 tables, 43 refs. **DLC**—The chief difficulty in constructing these charts was the precipitation over the oceans. After discussing correction by estimates of evaporation and use of island and coast stations, Schott is followed for Atlantic and for the remainder Meinardus' charts (1934) are decreased by $\frac{1}{3}$. The large scale seasonal equal area charts are discussed and the mean precipitation for each season is calculated by 5° zones of latitude for land (after Brooks and Hunt), sea and total. Two types of annual variation, Atlantic and West Pacific, are found over the oceans. *Subject Headings:* **1. Precipitation amount 2. Precipitation variations 3. Global precipitation.**—*C.E.P.B.*

3.4–201 551.577.21:632.7

Schrödter, H., **Die Niederschlagsverhältnisse in Sachsen-Anhalt 1947/48 als Ursache der kreisweisen Befallsunterschiede beim Massenauftreten des Rüben-Derbrüsslers 1948.** [The rainfall conditions in Saxony-Anhalt as a cause of the local distribution in severe occurrences of the turnip flea beetle.] *Angewandte Meteorologie*, 1(2):60–62, Sept. **1951.** 2 figs., table, 3 refs. **MH-BH**—Author correlated the mean rainfall of some 31 districts in various months of 1947 and 1948 with percentage area affected by the pest in 1948. Coefficients are variable but large, negative in June 1947 (development of larvae) and March 1948. Correlation

with rainfall June 1947+March 1948 was −0.63. Habitat of pest is southeast Europe. Relation should permit forecasts. *Subject Headings:* **1. Agricultural meteorology 2. Insects.**—*C.E.P.B.*

3.4–202 551.577.3:551.515.22(52)

Uwai, K., **On the movement of rainfall-groups (III). (Movement of rainfall-groups by the Typhoon "Kitty.")** *Journal of Meteorological Research*, Tokyo, 2(14,15):437–445, March 1951. 13 figs., equations. In Japanese, English summary p. (16). **DWB**—Four rainfall groups characterized by different amounts of rainfall are distinguished and isochrones of each group are given. The area of maximum rainfall was found to be the area of low temperature aloft and seemed to be in the region of convergence. The amount of rainfall was found to be proportional to the time variation of wind velocity. *Subject Headings:* **1. Rainfall distribution 2. Rainfall mechanics 3. Typhoon "Kitty" 4. Japan.**—*I.L.D.*

3.4–203 551.577.36:551.501.45

Williams, C. B., **Sequences of wet and dry days considered in relation to the logarithmic series.** *Royal Meteorological Society, Quarterly Journal*, 78(335):91–96, Jan. 1952. 2 figs., 3 tables, 5 refs. **DWB**—Sequences of wet (0.005 in.+) and dry days at Rothamsted and constant determined for series $d(x, x^2/2, x^3/3 \ldots)$, where each successive term is the number of sequences lasting 1, 2, 3 . . . days. Agreement very good for dry sequences, but single wet days are too few. Series for other localities also fit. *Subject Headings:* **1. Rainfall probability 2. Rothamsted, England.**—*C.E.P.B.*

3.4–204 551.577.37:551.515.22

Ando, T., **Rainfall accompanying typhoon.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(1):20–27, Jan. 1951. 9 figs., equations. In Japanese, English summary p. 27. **MH-BH**—A jet stream precedes a typhoon by some hundreds of kilometers and causes heavy rain controlled by the mixing ratio. Rainfall is of two kinds, vortical at the place of vorticity accumulation and moving with it, and that due to a line of convergence which moves north as a wave-like disturbance. *Subject Heading:* **1. Typhoon rainfall.** —*C.E.P.B.*

3.4–205 551.577.37

§Lillywhite, J. W., **A remarkable rainfall distribution.** *Weather Development and Research Bulletin*, Melbourne, No. 17:36–38, Aug. 1951. 7 figs. **DWB**—A situation on May 26, 1950, which produced ample rains in many parts of the State of Victoria, did not yield any rain in a drought stricken area of Western Victoria. A synoptic study of the winds shows that convergence in a rain shadow area was responsible for the lack of rain in that area. *Subject Headings:* **1. Rainfall distribution 2. Convergence 3. Victoria, Australia.** —*M.R.*

SNOW

3.4–206 551.578

Kuroda, Masawo, **Dynamics of snow cover.** *Japan Science Review, Ser. 1, Engineering Sciences*, 1(1):45–52, March 1949. diagrs., photos, ref., equations. In English. **DWB**—A review of experimental work on the mechanical properties of snow carried out by the author over a period of ten years. The strength of snow deposits, methods for measuring snow deposits, the hardness of snow deposits and their supporting force and the hardening process of snow surfaces are discussed. The analysis of these problems is presented theoretically and experimental data on the mechanical properties of snow are also given. *Subject Headings:* **1. Snow mechanics 2. Snow cover.**—*I.L.D.*

3.4–207 551.578.4

Magono, Chōjo, **On the fall velocity of snowflakes.** *Journal of Meteorology*, 8(3):199–200, June 1951. 2 figs., 2 refs. **DWB** A report of an experiment on the fall velocities of snowflakes of various sizes and of snow crystals. The velocity is approximately proportional to the square root of the maximum diameter of a snowflake. *Subject Heading:* **1. Snowflake velocity.** —*I.L.D.*

3.4–208 551.578.4

Roux, Ludwig, **Über den Anteil des Schnees am Gesamtniederschlag im Harz.** [On the proportion of snow in the total precipitation in the Harz.] *Annalen der Meteorologie*, 4(1–6): 252–258, **1951.** 4 figs., 6 tables, 6 refs., 7 equations. German and English summaries p. 252. **MH-BH**—Monthly means of snow and snow+rain as percentages of total precipitation are given for 15 places in Harz (123–1143 m) and expressed by linear equations against height. The year to year variability is a quadratic function ($a+bh-ch^2$). Results are compared with other mountain regions in Europe. *Subject Headings:* **1. Snow 2. Harz Mountains, Germany.** —*C.E.P.B.*

3.4–209 551.578.41(09)

Early discoverers. VI Robert Hooke. *Journal of Glaciology*, London, 1(10):576–577, Oct. **1951.** 6 figs. **DLC**—Extracts from "Micrographia" (London 1665) describing and illustrating structure of snowflakes and frost figures. *Subject Headings:* **1. Snow crystals 2. Hooke, Robert.**—*C.E.P.B.*

3.4–210 551.578.41

Kumai, Motoi, **Electron-microscope study of snow-crystal nuclei.** *Journal of Meteorology*, 8(3):151–156, June **1951.** 13 figs., 4 tables, 6 refs. **DWB**—The method of preparing nuclei specimens of snow crystals for study with the electron microscope is described. Microphotographs of snow nuclei crystals are given and the structure of the nuclei is analyzed. A mechanism for snow crystal growth is suggested. *Subject Headings:* **1. Snow crystal formation 2. Snow crystal nuclei 3. Microphotographs.**—*I. L. D.*

3.4–211 551.578.42

*Eichmeier, A. H., **Snowfalls—Paul Bunyan style.** *Weatherwise*, 4(6):124–127, Dec. **1951.** 5 figs. **DWB**—A description of the snow-fall regime on the Keweenan Peninsula, Lake Superior, Michigan, which is one of several localities having the highest snowfall east of the Rockies. The synoptic situation forming the heavy storms and the physical factors causing heavy snowfall over lake regions are discussed. The average annual snowfall for the period of record up until 1950 for the Upper Michigan Peninsula is shown on a map; a map of the region and a synoptic map of a heavy snowstorm are given. *Subject Headings:* **1. Snowfall data 2. Keweenan Peninsula, Michigan.**—*I. L. D.*

3.4–212 551.578.45

Mock, Conrad P., **Philadelphia's greatest snowstorm—December 25–26, 1909.** *Weatherwise*, 4(6):134–135, Dec. **1951.** 4 figs. **DWB**—The synoptic conditions associated with this snowstorm are discussed and the snowstorm described. *Subject Headings:* **1. Excessive snowfall 2. Philadelphia, Pennsylvania.**

3.4–213 551.578.46

Benfield, A. E., **The temperature in an accumulating snowfield.** *Royal Astronomical Society, Monthly Notices, Geophysical Supplement*, 6(3):139–147, April **1951.** 3 figs., table, 9 equations. **DLC**—A complex expression is derived for the variation of temperature with depth in a layer increasing by surface accretion at a constant rate, with an annual variation of surface temperature following a sine curve. The resulting profile in firn down to 15 m, with an accumulation of 8 m/year and a surface range of 20°C shows much lower temperatures than with no accretion. The effect of varying diffusivity due to density increasing with depth is also considered. *Subject Heading:* **1. Snow temperatures.**—*C.E.P.B.*

3.4–214 551.578.46:551.579.2

Himmel, James M., **Variation in depth of precipitation and in water equivalent of snow on the ground.** *Western Snow Conference, Proceedings*, 16th Annual Meeting, 1948, Reno, p. 117–131, Feb., **1949.** 4 figs., tables. Discussion by Harold A. Keith, p. 132. **DWB**—Data obtained in the Glacier Park region, Montana, in 1946–1947 show a high correlation between accumulated precipitation and water equivalent of snow pack. Remarkably few points (observations) show an appreciable deviation from a 45° straight-line regression curve.

Similar, though not so good, correlations were found in the Central Sierra Laboratory in 1947–1948. Deviations are explained in discussion by H. A. KEITH. *Subject Headings:* **1. Snow density 2. Precipitation effects 3. Hydrometeorology 4. Glacier Park, Montana. I. Keith, Harold A.**—*M.R.*

3.4–215 551.578.46:551.579.2

Klein, George J., **The Canadian snow-cover survey.** *Western Snow Conference, Proceedings*, 19th Annual Meeting, 1951, Victoria, B. C., p. 75–81, July **1951.** 3 figs., 2 refs. Discussion by J. E. Church, p. 81–83. **DWB**—Work of National Research Council of Canada in research on snow and ice began in 1935, and since January 1947 it has been carrying out systematic surveys in many parts of Canada by using data provided by the Meteorological Service. Instruments and location of stations illustrated. Brief mention is made of research on physical characteristics of snow tensile strength, etc. Remarks by J. E. CHURCH give relationship of this work to work being done in other countries. *Subject Headings:* **1. Snow surveys 2. Hydrometeorology 3. Canada. I. Church, J. E.**—*M.R.*

3.4–216 551.578.46

Richardson, W. E., **'Dirt polygons' on late-lying snow.** *Weather*, 6(12):383, Dec. **1951.** fig. **MH-BH**—Networks of ridges edged with dirt were seen on two small snow patches on Crossfell, Cumberland, July 7, 1951, with clear ice between. Ice ridges without dirt on underside also. *Subject Heading:* **1. Snow cover effects.**—*C.E.P.B.*

HYDROMETEOROLOGY

(*See also items:* 3.4–181, 3.4–214, 3.4–215)

3.4–217 551.579(09)

Schmidt, Milton O., **Hydrology comes of age.** *American Geophysical Union, Transactions*, 32(3):470–472, June **1951. DWB**—A brief review of the history of the science of hydrology, divided into periods of (a) early hydrology (before 1900), (b) empiricisms (1900–1921), (c) lethargy (1921–1931) and (d) empiricism to rational analysis (1932–1950). Recent developments such as use of radio for transmission of automatic stream gage or rainfall reports, radar detection of storms and statistical methods made possible by mechanized equipment are mentioned. *Subject Heading:* **1. History of hydrology.**—*M.R.*

3.4–218 551.579.1:551.501.45

Ford, Perry M., **Forecasting flood-season runoff.** *Western Snow Conference, Proceedings*, 16th Annual Meeting, 1948, Reno, p. 133–150, Feb. **1949.** fig., 8 plates, 3 refs. Discussion by Joseph Kittredge, p. 150–151. **DWB**—Application of statistical methods to flood forecasting in the Swan River area of the Flathead Basin of Montana. The multiple regression technique used here is described and amply illustrated. A fuller report by the same author is to be issued as a *U. S. Weather Bureau, Bureau of Reclamation Engineering, Monograph*. *Subject Headings:* **1. Runoff forecasting 2. Multiple regression techniques 3. Flathead Basin, Montana. I. Kittredge, Joseph.**—*M.R.*

3.4–219 551.579.2

Koelzer, Victor A., **Cumulative snowmelt runoff distribution graphs and their use in runoff forecasting.** *Western Snow Conference, Proceedings*, 19th Annual Meeting, 1951, Victoria, B. C., p. 30–39, July **1951.** 6 figs., 2 tables, 3 refs. Discussion by Walter U. Garstka, p. 40–41. Discussion by Milton S. Sachs, p. 41–46. **DWB**—*Subject Headings:* **1. Hydrologic forecasting 2. Snow melt distribution graphs. I. Garstka, Walter U. II. Sachs, Milton S.**

3.4–220 551.579.4:551.577.37

Alexander, Verne, **The greatest flood of history.** *Weatherwise*, 4(5):110–111, Oct. **1951** 3 figs. **MH-BH**—The meteorological conditions leading to the flood of July 13, 1951, which struck the middle west are described. An isohyetal map of the storms of July 9–12, 1951, is given. *Subject Headings:* **1. Floods 2. Excessive rainfall 3. Midwest United States.**—*I.L.D.*

3.4–221 551.579.4

Leatherdale, F. R., **The Bablingley river.** *Weather*, 6(12):377–378, Dec. **1951.** fig., 2 photos. **MH-BH**—Account of flooding of roads and ploughed fields in Norfolk (England) March–April 1951, when this small stream reoccupied an old course after heavy rain. *Subject Headings:* **1. Floods 2. Norfolk, England.**

3.4–222 551.579.5:626

Demoll, R., **Grundwasser—eine Lebensfrage.** [Ground water—a vital question.] *Umschau*, Frankfurt a.M., 52(1):5–7, Jan. 1, **1952.** 3 figs. **DGS**—Rapid increase of population and greater consumption per head has increased need for water 10–20 times in 80 years. Lowering of water table is dangerous to plants. Human activities make water run off more quickly and pollute ground water. Water conservation is essential for the future. *Subject Heading:* **1. Water conservation.**—*C.E.P.B.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY OF PARTICULAR PLACES

(*See also items:* 3.4–29, 3.4–50, 3.4–236)

3.4–223 551.581

Braak, Cornelius, **Kenmerkende Eigenschappen van het Tropische Klimaat.** [Characteristic properties of a tropical climate.] (*K.*) *Nederlandsch Aardrijkskundig Genootschap, Tijdschrift*, 67(5):617–629, [1950]. diagrs., tables. In Dutch, English summary p. 628. **DWB**—This description of a tropical climate covers the climatic characteristics within 15° north and south of the equator and is based primarily upon observations made in the Indonesian Archipelago. A detailed discussion of the characteristics of atmospheric pressure, wind force, temperature, humidity, thunderstorms and fog is presented. *Subject Headings:* **1. Tropical climatology 2. Indonesia.**—*I.L.D.*

3.4–224 551.582(728.4)

*Flanagan, Jeff E., **Características climáticas de El Salvador.** [Climatic characteristics of El Salvador.] *El Salvador, Centro Nacional de Agronomía, Santa Tecla, Circular Agrícola*, No. 43, July **1951.** [8 p.] graphs, tables, refs. **DWB**—Discussion of length of day, precipitation and temperature is accompanied by data, including a table of monthly and annual average of precipitation for 30 stations (period of record from 9 to 23 years) and graphs of monthly and average temperature for four stations (no period of record). *Subject Headings:* **1. Climatology 2. El Salvador.**—*M.L.R.*

3.4–225 551.582(648)

*Font Tullot, Inocencio, **El clima del África Occidental Española.** [Climate of Spanish West Africa.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. A*, No. 21, **1949.** 88 p. 27 figs., tables, refs. **DWB**—A substantial analytical and synoptic study based on thrice-daily observations at several stations (Sidi Ifni, Cabo Yubi, Villa Cisneros and Smara) for the war years (1941–1947). Besides the standard airways type of climatic summary for these stations, there is a full discussion of pressure and wind, temperature, humidity, fog, clouds, rain, thunderstorms, sandstorms, synoptic weather types, heat waves, the "Irifi," etc. and a special discussion of the climate of Ifni territory, local winds and rainfall distribution. *Subject Headings:* **1. Climate of Spanish Sahara 2. Synoptic studies 3. Spanish Sahara I. Spain. Servicio Meteorológico Nacional.**—*M.R.*

3.4–226 551.582:551.588.21(437)

Zapletal, Ladislav, **Podnebí Československa.** [Climate of Czechoslovakia.] *Meteorologické Zprávy*, 4(5–6):113–115, **1950.** 16 figs. In Czech. **MH-BH**—In order to show the effect of the orographic character and altitude of different parts of Czechoslovakia on climatic elements, a study of 16 different climatic factors is presented on as many charts showing those parts of the country where values are normal according to their geographic location and other parts with values above or below normal. The values of climatic elements accounted for are

connected with temperature, precipitation and cloudiness. *Subject Headings:* 1. Climate of Czechoslovakia 2. Regional climatology 3. Orographic effects 4. Czechoslovakia.—*S. T.*

3.4–227 551.582.2:629.13(46)

*Spain. Servicio Meteorológico Nacional. **Climatología aeronáutica de España.** [Aeronautical climatology of Spain.] *Spain. Servicio Meteorológico Nacional, Publicaciones, Ser. B,* No. 6, **1948.** 119 p. chiefly figs. and tables. DWB—A map shows the location of the 35 stations in Spain, Morocco, the Balearic Islands and the Canaries. The coordinates and height of each station are given and seasonal frequencies of visibility, cloud height, wind speed and direction, and state of the sky and weather are presented tabularly and graphically. The charts and tables are based on an analysis of 6500–7500 three-daily observations at each airport or observatory for the period 1940–47. The seasonal and annual wind roses are also presented on fold in maps of the entire area. No upper air data are given. *Subject Headings:* 1. Aeronautical climatology 2. Spain 3. Spanish Morocco 4. Balearic Islands.—*W. R.*

3.4–228 551.582.2:551.585.72

*Vivó, Jorge Abilio and Gómez, José C. **Climatología de México.** [Climatology of Mexico.] *Instituto Panamericano de Geografía e Historia, Publicación* No. 98, 1946. 73 p. chiefly charts and tables. DWB—This detailed climatology of Mexico consists entirely of charts. Charts of isotherms, isobars and isohyets for selected months, of mean annual relative humidity, of mean annual atmospheric vapor pressure and of days with frost are given. Distribution of winds at ground surface and in the upper atmosphere and the paths of cyclones, anticyclones, air masses and fronts are illustrated by maps. The climate is classified according to the Koppen system. *Subject Headings:* 1. Climate of Mexico 2. Climate classification 3. Mexico.—*I. L. D.*

CLIMATIC VARIATIONS

(See also items: 3.4–123)

3.4–229 551.583.57:54

Hora, Sunder Lal. **Hora's Satpura Hypothesis: an aspect of Indian biogeography.** *Current Science,* Bangalore, 19/12, Nov. 1950, 370, Dec. 1950. refs. DWB, DLC, MH-BH—A discussion of the "Symposium on the Satpura Hypothesis of the distribution of Malaysian Fauna and Flora to Peninsular India" (see item No. 2.3–135 in Feb. 1951 *Meteorological Abstracts*), with incidental references to Quaternary climate and notes by F. W. Dawson. *Subject Headings:* 1. Climatic changes 2. Orographic effects 3. Satpura Hypothesis 4. India.—*C. E. P. B.*

3.4–230 551.583.14

Flohn, Hermann. **Some remarks on the annual trend of weather in the Scottish Highlands.** *Royal Meteorological Society, Quarterly Journal,* 77/334, 67–75, Oct. 1951. fig., 8 refs. MH-BH—Referring to H. H. Lamb (see item No. 2.4–170 in Aug. 1951 *Meteorological Abstracts*) another writer gives curves of daily mean temperature, lapse rate and days with precipitation at Ben Nevis (1884–1903). *Subject Headings:* 1. Singularities 2. Climatic trends 3. Ben Nevis, Scotland.—*C. E. P. B.*

3.4–231 551.583.3

Klute, F. **Das Klima Europas während des Maximums der Weichsel-Warmzeit und die Änderungen bis zur Jetztzeit.** [The climate of Europe during the maximum of the Weichsel-Warm Glacial Period and the changes up to the present.] *Erdkunde,* Bonn, 5/4, 277–283, Oct. 1951. 6 figs., 40 refs. DGS—Maps of Europe and western Asia are constructed for Warm maximum showing Jan. and July isotherms at −2°C as by combined recent lines of evidence. Pressure distribution, cyclonic activity and winds are discussed and winds compared with Greenland at present. Polar front to winter rain limit Toronto over Atlantic to Brittany. Precipitation less than now especially in N. and E. Then assuming beginning of ice retreat 30,000 B.C., the author summarizes changes of temperature and ice melting. He thinks higher temperature came by suddenly about 8,500 B.C. and lasted at least until end of ice melting. This contradicts MILANKOVIĆ's solar curve, and author attributes it and

climatic optimum to increased solar constant. Dry periods were due to N. migration of Azores high. *Subject Headings:* **1. Climatic changes 2. Quaternary climates 3. Europe.** —*C.E.P.B.*

3.4–232 551.583.3:551.311.11

Rathjens, G., Jr., **Der Hochkarst im System der klimatischen Morphologie.** [The High Karst in the system of climatic morphology.] *Erdkunde*, Bonn, 5(4):310–315, Oct. 1951. fig., 19 refs. **DGS**—The origin and structure of the High Karst are discussed. The carrs coincide with the periglacial frost zone above 1000–1100 m. The much larger dolines (sinks) may be pre-Wurm, formed in a warm period. *Subject Headings:* **1. Erosion 2. Geological climates 3. Carso, Yugoslavia.**—*C.E.P.B.*

3.4–233 551.583.3

Störmer, Leif, **De store vekslinger i fortidens klima.** [The great changes in the climate of the past.] *Naturen*, Bergen, 75(6):161–183, 1951. 10 figs. **Pt. II,** *Ibid.*, 75(7):193–207, 1951. 5 figs., 13 refs. **DWB**—In Pt. I, author gives a popular review of the global climate millions of years ago and its development as determined by geologic-paleontological investigations. The meteorological research, based on 100 years' data, is briefly mentioned. Pt. II deals largely with various theories on climatic changes for which no single cause has been found. *Subject Headings:* **1. Climatic changes 2. Global climate.**—*W. N.*

CLIMATIC CLASSIFICATION

(*See also item:* 3.4–228)

3.4–234 551.585:551.577.32

†Lauer, W., **Hygrische Klimate und Vegetationszonen der Tropen mit besonderer Berücksichtigung Ostafrikas.** [Moisture climates and vegetation zones of the tropics with special reference to East Africa.] *Erdkunde*, Bonn, 5(4):284–293, Oct. 1951. 3 figs., fold. chart, 40 refs. **DGS**—In tropic lowlands alternation and lengths of dry and wet seasons are the important climatic factors. Author gives an "Isohygrome chart" (lines of equal numbers of arid months) for South America and Africa and compares it with vegetation types. Definition of an arid month is to be given in *Geographische Abhandlungen*, Bonn, No. 9, 1952. More detailed charts are given of East Africa and also "ombrothermic charts" to take account of highlands. *Subject Headings:* **1. Climatic zones 2. Africa 3. South America.**—*C.E.P.B.*

3.4–235 551.585:551.573

Leeper, G. W., **Thornthwaite's climatic formula.** *Australian Institute of Agricultural Science, Journal*, Melbourne, 16(1):2–6, March 1950. refs. **DLC**—A critical examination of Thornthwaite's climatic formula is presented. For several stations in Australia it underestimates the loss of water to the atmosphere in winter; it fails to distinguish between a dry Mediterranean summer and a wet monsoonal summer and it ignores the actual humidity. More reliable evaporation figures for Australia are obtainable by a simplified form of Thornthwaite's evapotranspiration formula and by the saturation deficit equation. *Subject Headings:* **1. Thornthwaite's classification 2. Evapotranspiration 3. Australia.**—*I.L.D.*

3.4–236 551.585:551.582.2(437)

Trefňa, Emilie, **Decimální třídění světových podnebí.** [Decimal classification of climates.] *Meteorologické Zprávy*, 4(5–6):123–125, 1950. 3 tables, equations. In Czech. **MH-BH**—The climatic index of Władislaw Gorczyński, as developed in Chap. 9 of his book "Comparison of climate of the United States and Europe" (Polish Institute of Arts and Sciences in America, New York, 1945), is explained and applied to the climate of Czechoslovakia, which is found to include Gorczyński's types 7, 8 and 10. The classification and its application to a few meteorological stations in Czechoslovakia is shown in two tables. The aridity factor is represented in a third table. *Subject Headings:* **1. Climatic classification 2. Climatic index 3. Czechoslovakia. I. Gorczyński, Władysław.**—*G.T.*

BIOCLIMATOLOGY-APPLIED CLIMATOLOGY

(*See also items:* 3.4–54, 3.4–55, 3.4–82, 3.4–117, 3.4–145, 3.4–226)

3.4–237 551.586:06

25-Jahr-Feier der Bioklimatischen Forschungsstelle Wyk auf Föhr. [25-year anniversary of the bioclimatic research center Wyk auf Föhr.] *Annalen der Meteorologie, Medizin-meteorologische Hefte,* No. 6:49–52, **1951.** **MH-BH**—Summaries of addresses at meeting on Aug. 12, 1951. *Subject Headings:* **1. Bioclimatology 2. Conferences. I. Bioklimatische Forschungsstelle Wyk auf Föhr.**

3.4–238 551.586:599.9

†*Dordick, Isadore L., **Climate and human welfare in Australian New Guinea.** Thesis (Ph.D.)—Johns Hopkins University, **1951.** 460 p. 52 figs., 74 tables, 155 refs. Typewritten.—An attempt is made to show that the climate of Australian New Guinea, in particular the humid tropical climate of the coastal lowlands, does not impose any insuperable physiological and psychological stress upon human beings, especially white Europeans adapted to a temperate climate, and that with certain adjustments in living and working habits a level of productivity comparable to that obtained in economically advanced temperate climate civilizations can be maintained. A detailed description of the climate of Australian New Guinea, containing data on atmospheric temperature and humidity, wind velocity, cloudiness and rainfall and a classification of the climate by THORNTHWAITE's method are presented. The effect of humid, tropical climate upon physiological and psychological behavior of livestock and their productivity is analyzed. The physiological tolerance of the climate is analyzed by the use of the effective temperature method. Means for the amelioration of climate by proper clothing and housing are considered. The relationships between climate, vegetation, soils, materials and disease are also examined. *Subject Headings:* **1. Bioclimatology 2. Human climatology 3. Climatic amelioration.**—*Author's abstract.*

3.4–239 551.586:612

Kanz, Ewald, **Biologische Messmethoden in der Meteorobiologie.** [Biological methods of measurement in meteorobiology.] *Annalen der Meteorologie, Medizin-meteorologische Hefte,* No. 6:34–37, **1951.** 5 figs. **MH-BH**—Describes methods in Munich of investigating possible weather effects on sense organs. An instrument was designed for testing sense of smell and showed positive relation to relative humidity. Threshold of hearing agreed with conductivity of air and bones, and increased during passage of fronts. Sense of taste was tested by 3 methods and was dominated by temperature. Sense of flavor was related to ozone concentration. Further tests are in progress. *Subject Headings:* **1. Bioclimatology 2. Sensory organs.**—*C.E.P.B.*

3.4–240 551.586:612

Leistner, Walter, **Die hygienische und bioklimatische Bedeutung des Dampfdruckes in Innenräumen und die Behaglichkeits- und Schwülegrenze.** [The hygienic and bioclimatic importance of vapor pressure indoors and the limits of comfort and sultriness.] *Annalen der Meteorologie, Medizin-meteorologische Hefte,* No. 6:18–31, **1951.** 14 figs., 8 refs. **MH-BH**—The most important physiological indicators in heat regulation are set out. Investigations in an underground work room near Heidelberg showed that human and artificial production of water vapor made conditions much less hygienic and lowered working efficiency. Vapor pressure was higher than outside by an amount nearly constant at any point; the room had a "sultriness component." Charts show relations of temperature, vapor pressure and equivalent temperature distributions to ventilation currents. In a UV radiation room in Wych/Föhr infrared radiation also lowered the sultriness limit. Radiation rooms should not exceed a v.p. of 11 mm or equivalent temperature 46°C. *Subject Headings:* **1. Bioclimatology 2. Sultriness.**—*C.E.P.B.*

3.4–241 551.586:612

Spangenberg, Wolf W., **Über die Ursachen der Schwüleempfindung. (Einige Bemerkungen zu der gleichnamigen Arbeit von H. Mrose in Z.f. Met. 5(1951), 55.)** [On the causes

of the feeling of sultriness. (Some remarks on the work with the same title by H. Mrose. . . .)] *Angewandte Meteorologie*, 1(2):33–35, Sept. **1951.** 2 figs., table. Mrose, H., **Weitere Bemerkungen zum vorstehenden Thema.** [Further remarks on the same theme.] *Ibid.*, p. 35. **DWB**—The feeling of sultriness is subjective. A plot of occasions against temperature and humidity shows great scatter, probably due to duration, other meteorological factors, condition of subject, etc. Center of gravity is 25°C, 70% R.H. The scatter varies seasonally and year to year. Some subjects distinguished between oppressive heat and sultriness with clear cut limits. Mrose in his comments points out that these limits fit in with his findings. *Subject Headings:* **1. Sultriness. I. Mrose, H.**—*C.E.P.B.*

3.4–242 551.586:612

Struller, Th. and Schröder, E., **Beeinflussen tellurische Faktoren Geburtszeitpunkt und -dauer bzw. Weheneintritt und -stärke?** [Do telluric factors influence time and duration of birth or occurrence and severity of birth labor?] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 6:31–34, **1951.** 2 figs., table, 6 refs. **MH-BH**—Authors apply *n*-method (3-hour intervals) to published statistics of relation of births to passage of fronts and find a statistically real increase of births by 20% 6–15 hours after warm or cold fronts and corresponding shortening of labor. No relation to occlusions. *Subject Headings:* **1. Medical climatology 2. *n*-method.**—*C.E.P.B.*

3.4–243 551.586:612.014.43

Ullrich, Herbert, **Wärmetod und Kältetod bei Mensch und Tier.** [Death of man and beast by heat and cold.] *Naturwissenschaftliche Rundschau*, 4(9):386–391, Sept. **1951.** 27 refs. **DWB**—A physiological account of the effects of heat and cold, heat-regulating mechanisms and acclimatizations. *Subject Heading:* **1. Physiological climatology.**—*C.E.P.B.*

3.4–244 551.586:632.9

Schrödter, H., **Über die Bedeutung des Mikroklimas für die Entwicklung parasitischer Pilze der Gattung *Ascochyta* (Erreger der Brennfleckenkrankheit der Erbse).** [On the importance of microclimate for the development of parasitic fungi of genus *Ascochyta* (cause of burn-spot disease of the pea).] *Angewandte Meteorologie*, 1(3):79–95, Dec. **1951.** 4 figs., 9 refs. **DWB**—The development and germination of spores of *A. pinodella* are strongly influenced by the microclimate of the pea crop. Moisture is most important, as damping by dew, mist or rain, especially for germination. Temperature within 9–21°C is unimportant. The slight importance of the disease in central Germany is attributed to the high moisture need for germination; the breeding of resistant types of pea is hardly possible. Climagrams can be used to forecast outbreaks. *Subject Headings:* **1. Bioclimatology 2. Germination.**—*C.E.P.B.*

MISCELLANEOUS APPLICATIONS

OPTICAL PHENOMENA

3.4–245 551.593.11

Vinař, Josef, Schreyerová, J. and others, **Fata morgana v našich krajích.** [Fata Morgana in our country.] *Meteorologické Zprávy*, 4(5/6):129–131, **1950.** In Czech. **MH-BH**—Two occurrences of Fata Morgana in Bohemia on August 11 and 27, 1950 are reported by eye witnesses and the physical background of the phenomenon of Fata Morgana is given. *Subject Headings:* **1. Fata Morgana 2. Czechoslovakia.**—*G.T.*

3.4–246 551.593.54

Götz, F. W. Paul, **Optics of the turbid atmosphere.** *International Union of Geodesy and Geophysics, Association of Meteorology, Transactions, Oslo 1948*, 2:89–93, **1950.** 3 figs., 11 refs. Mimeographed. **DWB**—The literature on special atmospheric extinction is reviewed. It is shown that the optics of a turbid atmosphere can be derived theoretically from good extinction curves in which the extinction coefficient and the scattering function can be interpolated if the size, number and quality of the turbid particles are known. *Subject Headings:* **1. Turbidity 2. Extinction coefficients 3. Visibility.**—*I.L.D.*

3.4–247 551.593.54

Lothian, G. F., **Blue sun and moon.** *Nature*, London, 168(4286):1086–1087, Dec. 22, 1951. table, equation, 4 refs. **DLC**—Refers to W. Paul and R. V. Jones, *Nature*, 168:554, 1951, and gives a new formula for calculation of wave lengths of maxima and minima of wave front. *Subject Heading:* **1. Blue sun.**—*C.E.P.B.*

3.4–248 551.593.54

Rodewald, Martin, **Die blaue Sonne vom 27. September 1950.** [The blue sun of Sept. 27, 1950.] *Naturwissenschaftliche Rundschau*, 5(1):8–15, Jan. **1952.** 4 figs., 28 refs. **DWB**—Summarizes earlier observations of colored suns and their causes—dust storms, volcanic erruptions and grass or forest fires. Then discusses 500 mb winds and smoke track of Canadian fire of Sept. 23–27, 1950, extent of colored suns and mixing of air mass. Experimental work of J. Kiessling on particle size is described. American forest fires rarely cause colored suns in Europe because upper winds are rarely favorable; this example was unusually late in the season. *Subject Headings:* **1. Blue sun 2. Smoke pall—Sept. 1950.**—*C.E.P.B.*

3.4–249 551.593.5

Stenz, Edward, **"Błekitne słonce."** [Blue sun.] *Gaseta Obserwatora PIHM*, Warsaw, 4(1):2–3, Jan. **1951.** **DLC**—The author describes, on the basis of numerous reports, an unusual optical phenomenon observed in the northwestern part of Poland. The sun, shining through a layer of high clouds, appeared in the form of a sharply limited disk of clear blue color in the morning hours of Sept. 27, 1950. The author discusses the possible causes of the phenomenon, which were not quite clear in view of the lack of information from abroad, but attributes them to smoke coming from Canada where there were great forest fires in the fall of 1950. *Subject Headings:* **1. Blue sun 2. Smoke pall—Sept. 1950 3. Poland.** *A.M.P.*

3.4–250 551.593.63

Bidault de L'Isle, G., **Halo avec parhélies observé le 28 février 1948 à l'Isle-Sur-Serein.** [Halo with parhelia observed February 28, 1948 at Isle-Sur-Serein.] *La Météorologie*, 4th Ser., No. 9:84, Jan./March **1948.** **DWB**—Phenomena included 22° halo, two parhelia and part of parhelic circle and a light column upwards from the top of the halo. *Subject Heading:* **1. Halo observation.**—*C.E.P.B.*

ELECTRICAL PHENOMENA

(*See also item:* 3.4–161)

3.4–251 551.594.22:634.9

Hromy a stromy. [Lightning strokes and trees.] *Meteorologické Zprávy*, 4(5–6):128, **1950.** In Czech. **MH-BH**—The problem whether certain species of trees more than others are subject to destruction by lighting is found to be as yet unsolved. Some effects of lightning strokes on trees are briefly mentioned and reference is made to "lookouts" of the U. S. Forest Service. *Subject Headings:* **1. Lightning strokes 2. Lightning damage 3. Forestry.** —*G.T.*

3.4–252 551.594.221

Malan, D. J. and Schonland, B. F. J., **The electrical processes in the intervals between the strokes of a lightning discharge.** *Royal Society of London, Proceedings, Ser. A*, 206:145–163, **1951.** 9 figs., 4 tables, 17 refs. **DWB** Observations with an electric fluxmeter showed that the junction-streamer field change j is $-$ when the stroke is nearer than 5 km and $+$ when further than 12 km. The j-change is due to a fairly slow discharge within the cloud moving out from the channel as streamers reach towards untapped regions of $-$ charge. This connects successive charged regions to the main channel by short links. The charged regions contributing to the strokes of a multiple discharge must be progressively vertically higher within the cloud by steps of 1 to 0.3 km. The mechanism creating separate strokes is described. Many distant flashes show a large field change at the end of the series of strokes, which may be due to upward streamers from top of cloud. *Subject Headings:* **1. Potential gradient 2. Lightning.** —*C.E.P.B.*

3.4–253 551.594.222

Hutchinson, W. C. A., **Point discharge currents and the earth's electric field.** *Royal Meteorological Society, Quarterly Journal*, 77(334):627–632, Oct. **1951.** 2 figs., 2 tables, 5 refs.

MH-BH—Nearly 1000 observations of earth current from a platinum point 12 m above ground and field at 2.5 m were made on 14 days with rain at Durham; they agreed closely with results at Kew. Point discharge current of either sign increased as square of field near the ground but it is suggested that for high fields the relation is linear. Examples of field changes preceding current changes are related to the reversal, by space charges, of the sign of the field between the point and the ground. *Subject Headings:* **1. Atmospheric electricity measurements 2. Potential gradient measurement.**—*C.E.P.B.*

3.4–254 551.594.223

Kuhn, Erich, **Ein Kugelblitz auf einer Moment-Aufnahme?** [Snapshot of ball lightning?] *Naturwissenschaften*, 38(22):518–519, Nov., **1951.** 3 photos. **MH-BH**—Reproduction of a photo of what appears to be ball lightning at Ludwigshafen. It descended vertically and burst a few meters above the ground. *Subject Heading:* **1. Ball lightning.**—*C.E.P.B.*

RADIO METEOROLOGY

3.4–255 551.594.6

Blum, Émile-Jacques; Denisse, Jean-François and Steinberg, Jean-Louis, **Sur l'interprétation des sursauts radioélectriques solaires.** [On an interpretation of solar radioelectric bursts.] *Académie des Sciences, Paris, Comptes Rendus*, 232(6):483–485, Feb. 5, **1951.** 5 refs., equations. **DWB** A discussion of the electric and magnetic conditions in the vicinity of the sunspots which may give rise to bursts. *Subject Heading:* **1. Sferics.**—*I.L.D.*

3.4–256 551.594.6

Meinhold, Heinz, **Die atmosphärische Störungen.** [Atmospherics (static).] *Angewandte Meteorologie*, 1(3):70–77, Dec. **1951.** 12 figs., 10 equations, 9 refs. **DWB** –Atmospherics are due to lightning. Annual and geographical distribution of thunder is discussed; maximum lightning frequency 30 sec. The rapid changes of current in the lightning channel radiate impulses which take up a damped sine curve. The range of various wave lengths is discussed; at night it increases to some 1000 km in 3–15 MHz. The energy radiated is discussed and various constants defined. *Subject Heading:* **1. Sferics.**—*C.E.P.B.*

3.4–257 551.594.6

Rocard, Yves, **Sur un mécanisme d'émission radioélectrique coronale.** [On a mechanism of coronal radioelectric emission.] *Académie des Sciences, Paris, Comptes Rendus*, 232(7):598–600, Feb. 12, **1951.** 2 refs. **DWB**—The mechanism for radioelectric coronal emission proposed by the author is based upon the concept of an intense hydrodynamic shock wave. *Subject Headings:* **1. Sferics 2. Shock waves.**—*I.L.D.*

3.4–258 551.594.7

Brocks, Karl, **Probleme der "Radiometeorologie."** [Problems of radiometeorology.] *Annalen der Meteorologie*, 4(1–6):78–86, **1951.** 2 figs., table, 17 refs., 4 equations. Summaries in German and English p. 78. **MH-BH**—A discussion of the effect of the atmosphere on radio waves 1 cm to 10 m. The equations of the "relative beam-curvature" (negative gradient of refractive index times earth's radius) are set out and constants of pressure and vertical gradients of temperature and humidity tabulated. Other measures of refraction in use are defined. Diurnal variations at Quickborn are discussed. *Subject Heading:* **1. Microwave propagation.**—*C.E.P.B.*

3.4–259 551.594.7:621.396.812

Grunenberg, J., **Die meteorologischen Bedingungen für die Überreichweiten auf dem Ultrakurzwellen-Band in Richtung Westen in der Nacht vom 4. zum 5. Juni 1951.** [The meteorological conditions for abnormal range of the ultrashort wave band from the west on the night of June 4–5, 1951.] *Meteorologische Rundschau*, 4(9–10):182–183, Sept.–Oct. **1951.** 2 figs., ref. **MH-BH**—The refraction indexes at various heights, calculated from upper air ascents, showed development during night of abnormally high values near the surface. These are attributed to a nocturnal anticyclonic inversion. *Subject Heading:* **1. Short wave radio transmission.**—*C.E.P.B.*

PART II. ANNOTATED BIBLIOGRAPHY ON DEW

By: *Nikolay T. Zikeev*

EXPLANATORY NOTE

In ancient times, many authors wrote of dew as a divine gift of heaven or as a means to preserve beauty and youth. Aristotle seems to be the first who investigated the nature of dew (3D–89); the writers of Roman times were also interested in this subject. Perliczy (3D–2) appears to have developed the first drosometer in the 18th century. Fundamental research on dew phenomena was made by Wells (3D–6) in the 19th century.

In the ensuing bibliography are gathered a representative sample of items available on the subject of dew. Textbooks which do not give results of original investigation of the problem or good summaries of dew observations are not as a rule included, nor are articles on dew-ponds, except where the item pertains to the problem of dew formation. Dew point hygrometers are included only when based on the actual condensation of dew on a surface.

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BIBLIOGRAPHY ON DEW

1725

3D–1 551.574.41(09)

Boyle, Robert, **Memoirs for an experimental history of cold.** (In: **The philosophical works of the Honourable Robert Boyle, esq;** . . . by Robert Shaw. London, W. and J. Innys [etc.] **1725.** p. 573–730. 7 figs.) **DLC**—The author determines experimentally that frost on a window pane is generated by aqueous particles that move up and down in the air within a room, condense into dew and freeze into ice because of the extreme cold of the neighboring external air communicated through the glass. He also remarks that dew and hoar frost are formed by the precipitation of vapor of the air upon a colder body. *Subject Headings:* **1. Dew formation 2. Frost formation 3. History of meteorology. I. Shaw, Robert** (*ed.*).

1727

3D–2 551.508.74

Perliczy, Johann Daniel, **Dissertatio meteorologico posterior exhibens drososcopium novum drosometriae curiosae specimen.** [A recent meteorological dissertation showing a new dew meter, an example of exact drosometry.] Wittenberg, **1727.** 16 p. 9 figs., numerous refs. **DWB**—The earliest work on methods of measuring the amount of dew. For this purpose the author designed a special balance with a dew condensing plate. *Subject Headings:* **1. Drosometers 2. History of meteorology.**

1736

3D–3 551.574.41

du Fay, Charles François, **Mémoires sur la rosée.** [Memoirs on dew.] *Académie des Sciences, Paris, Histoire et Mémoires,* **1736.** p. 352–374. **DWB, DLC**—The author remarks that GERSTEN's definition of dew as a deposit of water vapor evaporated from the soil during the day and condensed on the surface of plants as dew during the night is not a new one because many investigators in "L'Histoire de l'Académie de 1678" were of the same opinion. Further, he describes observations of dew and accompanying weather conditions. *Subject Headings:* **1. Dew formation 2. History of meteorology.**

1751

3D–4 551.574.41

le Roy, Charles, **Mémoire sur l'élévation et la suspension de l'eau dans l'air et sur la rosée.** [Memoir on the ascent and suspension of water in the air, and on dew.] *Académie des Sciences, Paris, Histoire et Mémoires,* **1751.** (issued 1754) p. 481–518. refs. **DLC**—During 1752 the author observed dew formation near the soil surface at Montpellier. He concludes that the amount of moisture in the air depends on temperature. The author is the first who recognized dew point temperature as the point of saturation of the air and showed that hoar frost formation is a process analogous to dew formation, but with air temperatures below 0°R. *Subject Headings:* **1. Dew formation 2. Dew point 3. History of meteorology.**

1767

3D–5 551.574 551.573

Hamilton, Hugh, **Philosophical essays.** 2nd ed. London, John Nourse, **1767.** 176 p. 3rd ed. London, **1772.** 75 p. numerous refs. **DWB**—In Pt. I, "On the ascent of vapours, rain and dew and on several other phenomena of air and water" (p. 1–77), the author studies the nature of water vapor. On the basis of his own and others' observations, he analyzes conditions under which cloud, rain and dew form. "Water vapours suspended in the air during the heat of day, fall down at night and form themselves into drops of dew, or if the night be very cold appear next morning crystallizing in a hoar frost." In the 3rd edition he analyzes in detail the interrelation between heating and cooling and the processes of condensation and evaporation of water vapor, and establishes the conditions necessary for cloud, rain and dew formation. *Subject Headings:* **1. Dew formation 2. Condensation 3. Evaporation 4. History of meteorology.**

1814

3D–6 551.574.41

Wells, William Charles, **An essay on dew, and several appearances connected with it.** London, T. Davidson, **1814.** 150 p. numerous refs. **DLC** -This is the first correct explanation of dew. (Many investigators of the 19th and 20th centuries called WELLS the father of the classic dew theory. *ed.*) He established that on clear nights the surface of the soil is colder than the air several feet above it. In cloudy weather, the temperature of the ground approaches, and is often identical with, that of the air and no dew is formed. A screen, interposed between the ground and the clear sky, prevents the covered portion of the ground from cooling below the temperature of the air. The time and amount of cooling usually varies with different bodies. All these phenomena are to be accounted for through the principles of radiation and condensation. Water vapor suspended in the air is reduced to the liquid state when in contact with a body cooler than itself. During cloudy weather, the ground is protected from cooling, the heat radiated from the earth is reflected back again and thus the same temperature is maintained at the surface and in the air. *Subject Headings:* **1. Dew formation 2. History of meteorology 3. Wells' dew theory.**

1832

3D–7 551.574.41

Harvey, George, **Meteorology.** (In: **Encyclopedia Metropolitana or Universal Dictionary of Knowledge.** 2nd Div. [London, Baldwin and Cradock, **1832.**] 174 p. 74 figs., 89 refs.) **DWB**—On p. 132–139 the author takes up the problem of dew. WELLS' theory is explained. Dew is caused by thermal radiation and condensation of vapor by cold. The influences of thermal conductivity, cold, weather conditions, etc. on dew formation are described. *Subject Heading:* **1. Dew formation.**

1844

3D–8 551.574.41

Fusinieri, Ambrogio, **Risposte su la rugiada, su la scomparsa della neve ec. at articoli dei signori Macedonio Melloni ed Angelo Bellani.** [Reply to articles by Macedonio Melloni and Angelo Bellani on dew, disappearance of snow, etc.] Padua, Do'i Torchj di Angelo Sicca, **1844.** 36 p.

numerous refs. **DWB**—As a result of his observations, the author differs with MELLONI and BELLANI and partially disproves WELLS' theory. The author concludes that the evaporation of water vapor from the soil during the night causes dew formation. *Subject Headings:* **1. Dew formation 2. Evaporation 3. Wells' dew theory.**

1847

3D–9 551.574.41:551.521:551.521.34

*Glaisher, James. **On the amount of the radiation of heat at night, from the earth, and from various bodies placed on or near the surface of the earth.** *Royal Society of London, Philosophical Transactions*, 137:119–216, **1847.** 108 tables. **DLC**—Systematic study of the problem of radiation processes near the ground, made at Greenwich, England, in the period from Feb. 1841 to the end of 1844. Special observations of the various effects of substances interposed between an exposed body and the sky, different substances covering grass, various heights above the surface, various colors of the surface, etc. were carried out. The author gives special attention to dew formation and its retention on grass throughout the day. He finds that the formation of dew depends upon the bodies on which it is deposited. Dew is heaviest where the temperature is the lowest. *Subject Headings:* **1. Radiation 2. Dew formation 3. Dew data 4. Greenwich, England.**

1853

3D–10 551.574.41

Does the dew fall? *National Magazine*, New York, 3(4):350–352, Oct. **1853. DLC**—On the basis of many examples of dew formation, it was established that dew forms by condensation of atmospheric moisture. *Subject Heading:* **1. Dew formation.**

1863

3D–11 551.574.41(09)

†Tomlinson, Charles, **Experimental essays.** London, Virtue Bros., **1863.** 123 p. **DLC**—Essay III is entitled "History of the modern theory of dew" (p. 95–123, numerous figs. and refs.). A detailed description of theoretical and experimental investigations and theories on the problem of dew formation before 1851. The author discusses the ideas of antiquity on this problem. People in ancient times, noticing that dew was most abundant on moonlit nights, supposed that the moon was the cause of dew. ARISTOTLE described it as a type of rain, formed in the lower atmosphere as a consequence of moisture, which has evaporated during the day and condensed into minute drops by the cold of the night. A detailed description of various opinions and theoretical and experimental investigations of the problem of dew formation from ancient times is given. The experimental investigations of HAMES, BOYLE, LE ROI, BACON, MUSCHENBRÖCK, DU FAY, WILSON and many others are described briefly. WELLS' "Essay on dew," published in 1814 aroused many discussions during his lifetime and was adopted in books and considered up to the present as the correct explanation of dew. *Subject Headings:* **1. Dew formation 2. History of meteorology.**

1866

3D–12 551.574.41:551.521.3

Magnus, P., **Über den Einfluss der Absorption der Wärme auf die Bildung des Taus.** [On the influence of heat absorption on dew formation.] *Akademie der Wissenschaften zu Berlin, Monatsberichte*, Feb. **1866.** p. 73–83. **DLC.** Trans. in: *Philosophical Magazine*, London, 32:111–118, **1866. DWB**—Author contends that dew formation itself offers the most striking and decisive proof of the small heat absorptive capacity of water vapor. Earlier theories remain true only if the great absorptive power formerly ascribed to invisible vapor is changed to apply to visible vapor. *Subject Headings:* **1. Condensation 2. Heat absorption 3. Dew formation.**—*M.P.K.*

1871

3D–13 551.574.41(02)

Buchan, Alexander, **Introductory text-book of meteorology.** Edinburgh, London, W. Blackwood, **1871.** 218 p. maps, figs. **DLC**—On p. 4 and 53–54 the author takes up the problem of dew and determines the conditions under which dew forms. A brief history of the development of present theories on dew formation is presented. The author remarks also that dew forms on the soil surface during clear and calm nights but is not deposited in cloudy weather. *Subject Headings:* **1. Dew formation 2. History of meteorology 3. Textbooks.**

3D–14 551.574.41

Rosenberg Lipinski, A. von, **Der praktische Ackerbau in Bezug auf rationelle Bodenkultur.** [Practical farming in relation to rational soil culture.] Breslau, **1871.** Vol. 1. p. 205. **NNC**—In this work the author remarks that in warm regions the amount of dew is very great and can be

used as a source of water for plants. In ancient times in Crimea special dew ponds were constructed, which still exist. *Subject Headings:* **1. Dew intensity 2. Dew ponds.**

1872

3D–15 551.574.41

Flammarion, Nicolas Camille, **L'atmosphère.** [The atmosphere.] 2nd ed. Paris, **1872.** 826 p. Unchecked. English trans. by C. B. Pitman. New York, Harper and Bros., **1873.** 453 p. 86 refs. **NN**—Chapter I of the fifth book, entitled "Water-clouds-rain" (p. 355–362), contains a description of the process of dew formation. A brief review of the principal works of Boussingault, Wilson, Pictet and others shows the viewpoints on the problem of dew during the author's time. *Subject Headings:* **1. Dew formation. I. Pitman, C. B.** (*trans.*).

1875

3D–16 551.508.77:551.508.74

Maquenne, H., **Recherches sur le pouvoir émissif des feuilles.** [Research on the emissive power of plants.] *Académie des Sciences, Paris, Comptes Rendus,* 80:1357–1359, **1875. DLC.** Review in: *Österreichische Gesellschaft für Meteorologie, Zeitschrift,* 10(22):353, Nov. 15, **1875. DWB**—Author remarks that the measurement of dew amount by rain gages does not give correct results because the radiation conditions between the copper rain gage and the leaves of plants are very different. Far better results can be obtained if the rain gages are painted black. *Subject Headings:* **1. Dew measurement techniques 2. Rain gages.**

3D–17 551.574.41

Messung der Taumenge. [Measurement of dew amount.] *Österreichische Gesellschaft für Meteorologie, Zeitschrift,* 10(13):211, July **1875. DWB**—A brief review of results of dew amount measurements made at Montsouris. *Subject Headings:* **1. Dew measurement 2. Montsouris, France.**

3D–18 551.574.41:551.524.3

Hamber, Hugo Emanuel, **La température et l'humidité de l'air à differentes hauteurs observées à Upsal pendant l'été de 1875.** [Air temperature and humidity at various heights observed at Uppsala in the summer of 1875.] (*K.*) *Vetenskaps Societeten i Upsala, Nova Acta,* Vol. 10, Fasc. 1(4), **1876.** 37 p. 6 figs., tables. **DLC.** Review by Albert von Obermayer in: *Österreichische Gesellschaft für Meteorologie, Zeitschrift,* 12(5):105–111, March **1877. DLC, DWB**—Special observations made at various heights above the soil surface in the summer of 1875 showed that on clear, calm nights the temperature difference between the heights of 3 cm and 52 cm above the surface can be 2–3 degrees or more. With heavy dew, the difference in temperature increases. *Subject Headings:* **1. Dew distribution with height 2. Temperature variations 3. Microclimatology 4. Uppsala, Sweden. I. Obermayer, Albert von.**

3D–19 551.574.41:551.524.1:551.571

*Rubenson, Robert, **Von den Temperatur- und Feuchtigkeitsverhältnissen in den untersten Luftschichten bei der Bildung des Thaues.** [Temperature and moisture conditions in the air layer near the surface during dew formation.] *Österreichische Gesellschaft für Meteorologie, Zeitschrift,* 11(5):65–75, March **1876.** 2 refs. **DWB**—Special investigations at a height of 122 cm above the surface and on the soil surface were made by the author to measure air temperature and humidity. These observations showed that the temperature difference between the soil surface and 122 cm above it is 2.4°C without dew and increases to 3.4°C with heavy dew. The relative humidity increases at the surface from 73 to 95%, and at 122 cm from 61 to 79%. *Subject Headings:* **1. Dew effects 2. Temperature variations 3. Humidity variations.**

1879

3D–20 551.574.41:551.508.74

Dines, George, **Dew, mist, and fog.** *Royal Meteorological Society, Quarterly Journal,* New Ser., 5(31):157–164, July **1879. DLC** Special attention is paid to dew on p. 157–160. The author begins with a brief description of conditions of dew formation as related to the amount of dew deposited upon the surface of the earth. For the measurement of dew deposits, ordinary watch glasses were exposed to open air in the evening and placed on different substances—grass and slate—and a dew board raised a few inches above the surface. This investigation, accompanied by minimum thermometer observations, showed that the annual amount of dew was, on the average, 3.65 inches. The author remarks that dew deposits vary according to climate and locality. For England the annual amount was about 5 inches. *Subject Headings:* **1. Dew formation 2. Drosometers 3. Dew intensity 4. England.**

3D–21 551.574.41

Jamin, Jules Celestin, **Complétements à la théorie de la rosée.** [Additions to the theory of dew.] *Journal de Physique et le Radium*, Paris, 8:41–48, Feb. **1879.** table, 6 equations. **DLC**—The author considers WELLS' theory of dew formation as a classic and analyzes the relation between saturation, radiation and condensation processes. Equations for these interrelations are given. *Subject Headings:* **1. Dew formation 2. Wells' dew theory.**

1881

3D–22 551.574.41:551.594

Widerstand des Thaues auf den Oberflächen der Isolatoren. [Resistance of dew on the surface of insulators.] *Elektrotechnische Zeitschrift*, Berlin, 2(6):217, June **1881.** table. **DLC**—Brief description of observations of dew resistance made during 1877 at Madras, India. The variations of the resistance are very high. On March 20, at noon, the resistance was 14,608 Megohms, and on May 12, at 5:30 a.m. as a result of dew deposits it was only 25.6 Megohms. The insulators were placed at 2.1 m and 3.3 m above the surface. *Subject Headings:* **1. Electrical properties of dew 2. Madras, India.**

1882

3D–23 551.574.41:551.521.32

Chistoni, Ciro, **Sulle cause della formazione della rugiada.** [Causes of dew formation.] Extract from: *Annali di Meteorologia*, Pt. 1. **1880.** Review in: *Österreichische Gesellschaft für Meteorologie, Zeitschrift*, 17(3):112–113, March **1882.** 2 refs. **DWB**—A review of the works on the problem of dew formation from ancient times and an analysis of observations. In conclusion, the author shows that dew forms during the night when the air is cooled by radiation processes. The intensive cooling by nocturnal radiation and the evaporation of water vapor from the soil are the principal causes of dew formation. *Subject Headings:* **1. Dew formation 2. Nocturnal radiation 3. History of meteorology.**

1883

3D–24 551.506.3:551.574.41:551.58

*Chaplin, Thomas, **Observations on the climate of Jerusalem.** *Palestine Exploration Fund, Quarterly Statement*, **1883.** p. 8–40. 17 tables. **NN**—Report embodies results of a series of observations for 22 years (1860–1882). Climatic factors discussed are: rain, atmospheric pressure, temperature, winds, clouds and dew. Numerous tables are included. (Similar article appears in German by the same author: **"Das Klima von Jerusalem."** [The climate of Jerusalem.] *Deutscher Palästina-Verein, Zeitschrift*, 14:93–112, 1891. 12 tables.) (*Same abstract* as No. 2E–3 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Dew data 2. Climate of Jerusalem 3. Climatic data 4. Jerusalem, Palestine.**—*H.P.K.*

3D–25 551.578.11 551.574.41

Gillman, F., **Salt rain and dew.** *Nature*, London, 29(738):172, Dec. 20, **1883.** 2 refs. **DLC**—The author writes that "Dr. Petzholdt of Dorpat University, who made a special study of South Russia, Caucasus and Russian Turkestan, established that the aqueous vapor in the atmosphere, due to the evaporation of sea and salt-lake water, usually contains chloride of sodium which is precipitated to the ground by rain and dew." At Giessen (Hesse), during a two year period, LIEBIG analyzed 77 rainfalls all of which contained salt. *Subject Headings:* **1. Dew composition 2. Rain composition 3. U.S.S.R. 3. Giessen, Germany.**

3D–26 551.574.41:016

†Hellmann, Gustav, **Repertorium der Deutschen Meteorologie.** [Review of German meteorology.] Leipzig, **1883.** 995 p. maps, tables. **DLC**—Works of German scientists for the period 1596–1869 on theoretical investigation of dew formation, instruments, observations and measurements of dew amount are listed on p. 714. *Subject Headings:* **1. Dew 2. Bibliographies 3. History of meteorology.**

3D–27 551.508.74

†Lee, J. Bridges, **A new meteorological instrument for determining the quantity of dew deposited in clear nights.** *Asiatic Society of Bengal, Proceedings*, Calcutta, No. 3:63–68, March **1883.** figs. **DLC**—This new instrument has a long, deep cylinder of glass or porcelain, protected externally by wood or metal and filled with pure mercury. The second cylinder floats vertically in the mercury inside the first one and supports a plate which is covered on the upper surface by a nonheat conducting substance. The mercury is used to compensate the effect of heat and cold. *Subject Heading:* **1. Drosometers.**

1885

3D–28 551.508.71 551.574.41

Hazen, Henry A., **The condensing hygrometer and the psychrometer.** *American Journal of Science*, 30(12):432–446, Dec. **1885.** 3 tables. **NN**—Description of an instrument for humidity measurement based on the principle of condensation. The author studies the theoretical basis of this instrument and the conditions necessary for dew formation. *Subject Headings:* **1. Dew point hygrometers 2. Dew information.**

1886

3D–29 551.574.41

Aitken, John, **On dew.** *Royal Society of Edinburgh, Transactions*, 33, Pt. I:9–64, **1885–1886.** tables. Abstract in: *Nature*, London, 33(846):256–258, Jan. 14, **1886. DLC**—Paper read before the Royal Society of Edinburgh on Dec. 26, 1885. The author reports the results of observations made to determine whether vapor does, or does not, rise from the ground on dewy nights. For this purpose, shallow trays were placed in an inverted position over the ground after sunset. The experiments showed that the inside of these trays was covered with dew and the grass inside was wetter than that outside. The observations on bare soil showed that the soil always gave off vapor. The surface of the soil also lost heat. On dewy nights a difference of from 10° to 18°F was frequently indicated by two thermometers, one placed on top of the grass and the other at its roots. Experiments on dew formation on roads showed that the air in contact with stones, fair conductors of heat, did not cool as much as that in contact with grass. The rising vapor was condensed on the undersides of stones. Observations of the effect of wind and an examination of the different forms of vegetation were also made. *Subject Headings:* **1. Dew formation 2. Dew sources 3. Dew on roads.**

3D–30 551.574.41

Alvord, H. E., **Temperature observations relative to dew formation.** *Science*, New York, 8(187):207, Sept. 3, **1886. DLC**—Extensive temperature observations for the study of dew formation were made at Haughton during several months of 1884. These observations show that during the formation of dew the minimum temperatures were in the layer about four inches above the ground. The surface temperature was lower than the temperature at a depth of several inches. The author considers the temperature of the surface on which dew is formed as an essential factor in its formation. *Subject Headings:* **1. Dew formation 2. Temperature profile.**

3D–31 551.574.41(54)

Frazer, A. T., **Tropical dew.** *Nature*, London, 33(860):583, April 22, **1886.** ref. **DLC**—The author observed in Bellary, India, luxuriant vegetation under some agricultural tools which had been left on the ground during a period when there was no rain. The phenomenon was explained by Aitken's paper on dew (*see item* 3D–29 above) in which he advanced the idea that dew was not deposited from the air but rose and condensed from the soil below. Frazer believes that laying iron grating on bare ground could be used to secure moisture in those areas where irrigation is lacking. *Subject Headings:* **1. Dew formation 2. Bellary, India.**

3D–32 551.574.41:551.574.42

P——, H. F., **Dew.** *Nature*, London, 33(848):293–294, Jan. 28, **1886.** ref. **DLC**—Author confirms Aitken's observations (*see item* 3D 29 above). After a clear, cold night abundant hoar frost was observed on grass, the tops of wooden rails and on the topmost twigs of bushes in tall hedges. Lower twigs had little or no hoar frost. Stones on the road were thickly covered on their under surfaces. The author concludes that cooling of the bodies below the temperature of the surrounding air and a supply of water vapor from the air are necessary for dew and hoar frost formation. *Subject Headings:* **1. Dew formation 2. Hoar frost formation.**

1887

3D–33 551.574.41:551.574.42

Shenrok, A., **K voprosu ob opredelenii izmorozi i gololeditsy.** [On the determination of rime and glazed frost.] *Akademiia Nauk, SSSR, Meteorologicheskiĭ Sbornik*, 11(2):36–42, **1887. DLC**—A short review of the conditions accompanying the formation of dew, hoar frost, rime and glazed frost. *Subject Headings:* **1. Dew formation 2. Hoar frost 3. Rime 4. Glaze.**

1888

3D–34 551.508.7:551.574.41

†Shaw, Sir William Napier, **Report on hygrometric methods: First part, including the saturation method and the chemical method, and dew point instruments.** *Royal Society of London, Philosophical Transactions, Ser. A*, 179:73–149, **1888.** 4 figs., tables, 26 refs. **DLC**—Description of

several instruments for determining the humidity of the air by the dew point method and observing the temperature at which a deposit takes place on a particular cooled surface. *Subject Headings:* **1. Dew point hygrometers.**

1889

3D–35 551.5:016

U. S. Signal Office. **Bibliography of meteorology. Pt. 2. Moisture.** Washington, D. C., **1889.** 475 p. **DLC**—On p. 57–72 a bibliography on dew is given for the period 1607–1887. *Subject Headings:* **1. Dew bibliographies 2. Bibliographies. I. Fassig, Oliver L.** (*ed.*).

1891

3D–36 551.574.41(54)(42)

*Badgley, W. F., **Some remarks on dew.** *Royal Meteorological Society, Quarterly Journal*, 17(78):80–86, April **1891.** table. **DLC**—Observations were started for the purpose of verifying the commonly accepted theory on dew. The first set of these observations was made in 1888 in India on the Pulney Hill plateau at heights from 4500 to 7500 ft above sea level and the second set in 1889–1890 at Kyrewood House near Tenbury in Worcestershire. To measure the amount of dew the author used a dull zinc plate about 8½ in. in diameter. During a period of twelve months, 1.2040 in. of dew were collected on the under side of the plate. It was established that the source of dew is water vapor from the air, earth and plants. The greatest amount of dew comes from the earth. The small amount observed on stone roads is explained by the good thermal conductivity of stones and their close contact with the ground which leads to the air being cooled less than that in contact with grass. Some observations of the effect of wind and examination of different forms of vegetation are also described. M. JACKSON remarks on p. 87 that he has noticed that dew formation was generally greater after a period of heavy rain when the earth was thoroughly soaked. This shows, in his opinion, that more dew was drawn from the ground than from the air above it. *Subject Headings:* **1. Dew formation 2. Drosometers 3. Dew measurement 4. Dew sources 5. India 6. England. I. Jackson, M.**

1892

3D–37 551.508.74

Bilderling, P. A., **Ob izmerenii rosy.** [On dew measurement.] *Meteorologicheskii Vestnik*, 2:280, **1892.**—Unchecked. Description of a drosometer constructed by the author. This instrument records dew collected on a wooden plate; the balance of WILD's evaporator and the usual self-recorder are parts of this drosometer. *Subject Heading:* **1. Drosometers.**

3D–38 551.574.41:551.501

*Russell, R., **Observations on dew and frost.** London, Edward Stanford, [**1892**]. Unchecked. Summary in: *Nature*, London, 47(1209):210–213, Dec. **1892.** 2 refs. **DLC**—A series of experiments on dew formation and measurements of its intensity were made by the author during 1891–1892. The greatest amount of dew was found invariably in the interior of closed vessels over grass and sand, on the under sides of stones, slate, etc. Leaves of bushes, leaves lying on the ground and grass blades were completely covered with dew. The temperature of the space under a glass plate, suspended near the surface of the soil, was higher than that of the upper surface. More dew was condensed on plates suspended over grass than over bare soil. Occasional observations of the distribution of dew without careful comparison with weather conditions showed that dew forms generally when the air is humid (in England during southwesterly and westerly winds) and on calm nights. Free radiation or exposure are perhaps the most effective causes of dew. *Subject Headings:* **1. Dew formation 2. Dew sources 3. Dew observation 4. England.**

3D–39 551.508.74(436)

*von Kerner, Fritz, **Ein Instrument zur Messung des Thauniederschlages.** [An instrument for measuring dew precipitation.] *Meteorologische Zeitschrift*, 9(3):106–108, March **1892.** **DLC**—The author describes in detail a new instrument which is based on the principle of the gravimetric hygrometer. The observations in Vienna during the summer of 1891 showed that the amount of dew can be as much as 0.54 mm on calm, clear nights. A very small amount of dew was observed with southerly winds and on cloudy nights. *Subject Headings:* **1. Drosometers 2. Dew data 3. Vienna, Austria.**

3D–40 551.506:551.574.41(431/5)

*Wollny, Ewald, **Untersuchungen über die Bildung und die Menge des Thaues.** [Investigations on formation and amount of dew.] *Forschungen auf dem Gebiete der Agrikultur-Physik*, Heidelberg, 15:111–151, **1892.** 7 tables, 13 refs. **DA**—Special observations of dew were carried out at the experimental station near Munich during 1881–1882. Observations of dew frequency (without

measurements of the amount), formation of dew on different plants and intensity of dew formation on the surface of different types of soil (turf, clay, sand, etc.) were made. It was found that dew formation on turf was 252 gr/m², on clay 249 gr/m², and on sand only 171 gr/m². The annual amount of dew deposits in 1881 was 28.18 mm and in 1882, 31.77 mm, i.e., 3.46% and 3.23% of the total amount of precipitation. *Subject Headings:* **1. Dew data 2. Annual dew variations 3. Munich, Germany.**

1894

3D–41 551.574.41

Homén, Theodor, **Bodenphysikalische und meteorologische Beobachtungen mit besonderer Berücksichtigung des Nachtfrostphänomens.** [Meteorological and soil physics observations with special reference to radiation frost phenomenon.] Berlin, **1894.** 225 p. numerous figs. and tables. **DA**—On p. 81 under the title "Taubildung" [Dew formation], an analysis of the conditions for dew formation is given. *Subject Heading:* **1. Dew formation.**

3D–42 551.574.41551.574.42

Voeĭkov, Aleksandr Ivanovich, **Rosa i ineĭ.** [Dew and hoar frost.] *Meteorologicheskiĭ Vestnik*, 4(9):337–345, **1894.** 8 refs. **DWB**—The conditions under which dew and hoar frost form, and various measurements of dew amount are presented and analyzed. Special attention is paid to dew and hoar frost formation in forests. *Subject Headings:* **1. Dew intensity 2. Hoar frost 3. Forest influences.**

1895

3D–43 551.574.41

*Sokhotskiĭ, IU., **Nabliudeniia nad rosoĭ na meteorologicheskoĭ stantsii 2go razriada "Zapol'e."** [Dew observations at the 2nd order station "Zapol'e."] *Meteorologicheskiĭ Vestnik*, 5(8):277–282, **1895.** tables, ref. **DWB**—The author presents the results of observations of dew made by means of a Bilderling drosometer in Zapol'e (Luga region, Leningrad area) in 1891. The maximum amount of dew was observed in September (1.61 mm) when the daily mean was 0.15 mm. The minimum amount was observed in June (0.53 mm) when the daily mean was 0.06 mm. Special observations were made to study the effect of cloudiness, wind, humidity, soil moisture and grass cover on the intensity of dew formation. The author concludes that dry, fine and grass-free soil can condense a greater amount of dew. (Same article was published in German in: *Meteorologisches Nachrichtenblatt*, No. 8, 1895.) *Subject Headings:* **1. Dew data 2. Annual dew variations 3. Drosometers 4. Zapol'e, U.S.S.R.**

1896

3D–44 551.574.41

*Trabert, Wilhelm, **Meteorologie.** [Meteorology.] Leipzig, **1896.** 149 p. 49 figs., 7 tables, numerous refs. **DLC**—On p. 110–111 the author discusses the problem of dew and hoar frost formation. Wells' theory of dew formation is correct in the author's opinion. Wollny's and Russell's investigations, however, showed that more vapor is derived from the earth than from the air. The quantity of water vapor given off by plants also causes dew formation. Houdaille determined that the annual amount of dew is 6–7 mm, i.e., nearly 1% of the annual amount of total precipitation. *Subject Headings:* **1. Dew formation 2. Dew intensity 3. Wells' dew theory.**

1899

3D–45 551.574.41

Kravkov, S., **Rosa podzemnaia.** [Underground dew.] (In: **Brokgaus i Efron, Entsiklopedicheskiĭ Slovar'.** Leipzig, St. Petersbourg, **1899.** Vol. 27. p. 100. 5 refs.) **DLC**—The author describes the special conditions under which dew forms in the soil. Its formation was observed when the upper layers of the soil were cooler and more humid than the lower. Underground dew is very important for maintaining soil moisture. Investigations of many scientists showed that underground dew is formed in black soil but does not appear in clay and sandy soils. *Subject Heading:* **1. Soil moisture.**

3D–46 551.574.41

*Liuboslavskiĭ, —, **Rosa.** [Dew.] (In: **Brokgaus i Efron, Entsiklopedicheskiĭ Slovar'.** Leipzig, St. Petersbourg, **1899.** Vol. 27. p. 98–100. 9 refs.) **DLC**—Sources of dew are: water vapor in the air, moisture derived from the ground and moisture given off by plants. The first observations of the amount of dew were made by Melloni. At Montpellier, France, the annual amount of dew was 3.96 mm, as recorded by Houdaille. In the Luga region, near Leningrad, the amount determined by Sokhotskiĭ in summer was 4.1 mm; the maximum at night was 0.22 mm. Wollny's observations at Munich show that the annual amount of dew is not more than 3.5% of the total annual precipitation. *Subject Headings:* **1. Dew formation 2. Dew sources 3. France 4. Germany 5. U.S.S.R.**

1900

3D–47 551.574.41

Allingham, William, **A manual of marine meteorology for apprentices and officers of the world's merchant navies.** London, Grifin Co., **1900.** 182 p. 9 maps, table. **NN**—On p. 149 the author describes conditions of dew formation and remarks that dew can be deposited when no clouds are visible. *Subject Heading:* **1. Dew formation**

3D–48 551.574.41551.574.42

Nicolas, Ad., **Le givre et la rosée.** [Hoar frost and dew.] *Société d'Agriculture, Sciences et Art d'Angers, Mémoires,* 5:166–174, **1902. DLC**—Basic problems connected with atmospheric humidity and the formation, evaporation, absorption and freezing of dew, and the correlation between dew and the formation of cirrus clouds are discussed in nontechnical language with emphasis on conditions prevailing in France, in the Sahara and in the tropics. *Subject Headings:* **1. Dew 2. Hoar frost.**—*G.T.*

1902

3D–49 551.574.41

Tyndall, John, **Heat a mode of motion.** 6th ed. New York, D. Appleton, **1902.** 591 p. 125 figs., numerous refs. **DLC**—In lecture XVII (p. 496–505) entitled "Dew" the author describes WELLS' experiments on dew formation and gives a summary of WELLS' theory of dew. The causes of deposition and conditions necessary for the formation of dew are also discussed. *Subject Headings:* **1. Dew formation 2. Wells' dew theory.**

3D–50 551.574.41

Zona, Temistocle, **La rugiada.** [Dew.] (*R.*) *Accademia de Scienza, Lettere e Belle Arti di Palermo, Atti,* 3rd Ser., Vol. 6, **1902.** 6 p. Abstracted from reprint. **NN**—Description of the conditions of dew formation. *Subject Heading:* **1. Dew formation.**

1904

3D–51 551.508.74

Ferle, Fr. R., **Über ein Taumessverfahren.** [A method of measuring dew.] *Zeitschrift für angewandte Meteorologie,* Berlin, 21(3):49–52, March **1904.** fig. Abstract in: *Science,* New Ser., 19(488):740, May 6, **1904. DWB**—Early principles of dew amount measurement (i.e., by weighing or by means of hygroscopic substances) depended on many conditions (wind, evaporation, etc.) and could not be used for a correct measurement of dew deposition. The author obtained better results by using a combination of blotting paper and litmus paper. *Subject Headings:* **1. Dew measurement techniques 2. Drosometers.**

1906

3D–52 551.574.41 551.578.11

Leather, John Walter, **The composition of Indian rain and dew.** *India, Dept. of Agriculture, Memoirs, Chemical Ser.,* 1(1):1–11, April **1906.** 5 tables, 7 refs. **DA**—The first part contains a summary of the investigation made to determine the amount of nitrogen in precipitation in India. In the second part, the author gives results of the observations which were made at Rothamsted during Sept. 1904–March 1905. Total amount of dew during this period was 0.170 in. and the amount of nitrogen was 0.111 pounds per acre. At Ploti (U.S.S.R.), a mean value of 5 mg of ammonia per litre of dew was found. *Subject Headings:* **1. Dew composition 2. Rain composition 3. India 4. Rothamsted, England 5. Ploti, U.S.S.R.**

3D–53 551.574.41

McPherson, J. G., **The formation of dew.** *The Quiver,* London, No. 483:220–223, Jan. **1906.** photo. **DLC**—A discussion of the problem of dew formation: does it rise from the surface of the soil or fall from the air. The author gives many opinions on this subject and his own experimental observations. The conclusion is that dew rises and rarely falls. Hoar frost formation is a convincing fact that dew is formed by the vapor which rises from the warm earth and not from the air above. *Subject Heading:* **1. Dew sources.**

3D–54 551.574.41 551.574.42

Passerini, Napoleone, **Meteorologia e climatologia.** [Meteorology and climatology.] Milan [**1906**]. 282 p. 57 figs., tables, refs. **DWB**—In Chap. 9, entitled "Idrometeore" (p. 170–177), the author reviews conditions favorable to the formation of dew, hoar frost, rime and glazed frost and describes methods of measuring their amount. *Subject Headings:* **1. Dew 2. Hoar frost 3. Rime 4. Glaze.**

1908

3D–55 551.574.41

Abbe, Cleveland, **Formation of dew on tree tops.** *Monthly Weather Review*, 36(12):410–411, Dec. **1908. DWB**—The author observed that the rate of cooling by radiation increases proportionally to the size of the surface or to the cessation of the absorption of heat from the ground below. Conditions of dew formation on tree tops are described. *Subject Headings:* **1. Dew formation 2. Microclimatology.**

1909

3D–56 551.574.41

Cohen, J. B., **Dew-ponds.** *Nature*, London, 80(2063):309, May 13, **1909. DLC**—Critical remarks on HUBBARD's theory of dew ponds. Brief discussion of the author's experiments and investigations. A special expedition to the Berkshire Downs showed that the temperature of the water in dew ponds was higher than the temperature of the air. The author confirms the view of AITKEN that the greatest portion of moisture deposited as dew is derived from the ground and not from the air. *Subject Headings:* **1. Dew sources 2. Dew ponds.**

1910

3D–57 551.574.41:581.055

Bialinitskiĭ-Birulia, A. S., **Opyt nabliudeniĭ nad vliianiem rosy na nekotorye kul'turnye rasteniia.** [Observations of the influence of dew on some cultivated plants.] *Meteorologicheskiĭ Vestnik*, No. 1, **1910.**—Unchecked. *Subject Headings:* **1. Dew effects 2. Plant ecology.**

3D–58 551.574.41:551.575(45)

Chistoni, Ciro, **Rugiada e guazza.** [Dew and wet fog.] (*R.*) *Accademia delle Scienze Fisiche e Matematiche di Napoli, Rendiconti*, No. 5/6, May/June **1910.** 5 p. 8 refs. Abstracted from reprint. **DWB**—A brief review of the principal works on dew and dew ponds. The author studies the influence of local weather conditions on dew and wet fog formation in Italy. Breezes, tramontana and mountain valley situations are considered. *Subject Headings:* **1. Dew 2. Wet fog 3. Italy.**

3D–59 551.574.41

Gibson, Herbert, **The genesis and function of the dew-pond.** *Meteorological Magazine*, London, 45(532):63–67, May **1910. DLC**—An analysis of the construction of dew ponds and the conditions of the water accumulation therein shows that the name dew pond is a misnomer; rain pond or down pond would be more accurate. *Subject Heading:* **1. Dew ponds.**

3D–60 551.574.41:551.594.14

Negro, Carlo, **Über die Radioaktivität des Taues.** (**Sulla radioattività della rugiada.**) [Radioactivity of dew.] Translated from manuscript by Max Iklé in: *Physikalische Zeitschrift*, Leipzig, 11(5):189–191, March 1, **1910.** 6 tables, 2 refs. **DLC**—Series of observations on the radioactivity of dew were made with the Elster and Geitel electrometer. Dew was collected on special plates during the night. The radioactive capacity decreases by approximately one half during the first half hour. The negative dispersion was constantly higher than the positive. *Subject Headings:* **1. Electrical properties of dew. I. Iklé, Max** (*trans.*).

3D–61 551.574.41

Shaw, Sir William Napier, **Dew.** (In: **Encyclopedia Britannica.** 11th ed. Vol. 8, **1910.** p. 135–137. 2 figs., 29 refs.) **NN**—An extensive summary on dew and dew ponds containing: an historical account of the principal theories of dew formation, intensity of dew and description of results obtained by DINES, WOLLNY and BADGLEY on dew measurement. *Subject Headings:* **1. Dew formation 2. Dew ponds.**

3D–62 551.574.41:551.506(68)

*Sutton, J. R., **Some observations of dew at Kimberley.** *Royal Dublin Society, Scientific Proceedings*, New Ser., 12(24):206–274, Jan. **1910.** 3 tables, 10 refs. **DLC** The author believes that the opinion that dew can be formed only under a clear sky is incorrect. Dew may form under a cloudy sky; clear sky is only more favorable to dew deposition. Observations during four years (1905–1908) at Kimberley showed that dew was observed 258 times with clear sky, 85 times with little cloudiness and 177 times when the amount of cloudiness was great. The author remarks that radiation is on the average more intense during clear nights. During 1900 he observed that average fall of temperature at Kimberley, when the relative humidity was 90% or more, from midnight to the morning minimum was 4.9° on clear nights and 4.3° on very cloudy nights. When relative humidity is high, dew can be formed with overcast sky. Wind is an important factor in preventing dew formation. *Subject Headings:* **1. Dew formation 2. Dew data 3. Cloud effects 4. Kimberley, South Africa.**

3D–63 551.574.41

Une théorie nouvelle de la rosée. [A new theory on dew.] *Huy, Belgium. École d'Agriculture de l'État, Association des Anciens Élèves, Bulletin*, No. 4:610–611, **1910.**—Unchecked. *Subject Heading:* **1. Dew.**

3D–64 551.574.41(436)

von Schön, J. H., **Tauwasser.** [Dew water.] *Österreichische Wochenschrift für den öffentlichen Baudienst*, No. 22, **1910.** Unchecked. Review in: *Meteorologische Zeitschrift*, 27(12):561, Dec. 1910. **DWB**—Very intensive formation of dew was observed in the Brusna River region. Large drops of dew precipitated from trees and plants and formed small ponds. *Subject Headings:* **1. Dew intensity 2. Brusna River, Yugoslavia.**

1911

3D–65 551.574.41

Clatworthy, J. P., **Dew ponds and the dry season.** *Nature*, London, 88(2192):8, Nov. 2, **1911.** **DLC**—The author paid a visit to the Chanctobury dew pond about the end of August 1911 and was surprised by its flourishing state. At that time the general water level was much below the normal and the surrounding water plants were much trodden under by sheep and cattle. *Subject Headings:* **1. Dew ponds 2. England.**

3D–66 551.574.41

Martin, Edward A., **Dew ponds in 1911.** *Nature*, London, 88(2194):77, Nov. 16, **1911.** **DLC**—The summer of 1911 was very dry. The author made an inspection of dew ponds in the region of Wooton River. Most of them were water free, but near the Wooton River was one pond filled with water. This was on low ground under the hills and it was surrounded by tall trees, some of which completely overhung the pond. Thus, evaporation was reduced to a minimum and conditions for condensation were favorable. *Subject Headings:* **1. Dew ponds 2. England.**

3D–67 551.574.41(42)

Skinner, Sidney, **Dew in 1911.** *Nature*, London, 88(2195):111, Nov. 23, **1911.** **DLC**—A brief report on dew measurements made by the South-Western Polytechnic Institute, Chelsea SW, England. Between July 31 and Sept. 5, 1911 the author collected an amount of dew equivalent to $\frac{1}{5}$ in. of water. *Subject Headings:* **1. Dew measurement 2. Chelsea, England.**

3D–68 551.574.41:551.579

Raman, Emil, **Bodenkunde.** [Soil science.] Berlin, **1911.** 619 p. 63 figs., 2 tables. **DA**—On p. 382–384 the author pays special attention to soil moisture resulting from dew. Dew can be an important factor in supplying moisture to the soil surface. *Subject Headings:* **1. Dew effects 2. Soil moisture.**

1912

3D–69 551.574.41

Baxendell, Joseph, **Dew and the diurnal variation of rainfall.** *Meteorological Magazine*, London, 47(554):29–30, March **1912.** **DLC**—Rain gages collect not only precipitation but also occasionally dew deposits. The author observed that gages having good thermal contact with the warm earth and exposed to a very limited surface contained surprisingly little dew or true hoar frost. *Subject Heading:* **1. Dew measurement.**

3D–70 551.574.41:631.4

Loske, —, **Gigroskopichnost' pochvy i podzemnaia rosa.** [Hygroscopy of soil and underground dew.] *Trudy po Sel'skokhoziaistvennoĭ Meteorologii*, Leningrad, 9:105, **1912.** numerous refs. **DWB**—A review of works on conditions necessary for dew formation underground. *Subject Headings:* **1. Dew 2. Soil moisture.**

3D–71 551.574.41

Martin, Edward, **Dew and mist ponds.** *Scottish Geographical Magazine*, Edinburgh, 28(11):582–583, Nov. **1912.** **DLC**—An abstract of a paper read before the Geography Section of the British Association. The reviewer analyzes conditions of dew formation and its gathering in dew ponds. *Subject Headings:* **1. Dew formation 2. Dew ponds.**

3D–72 551.574.41(45)

Negro, Carlo, **Osservazioni sulla rugiada.** [Dew observations.] *Accademia Nazionale dei Lincei, Rome, Atti, Sessione 2*, 65:1–7, Jan. **1912.** 8 refs. Abstracted from reprint. **DWB**—The author analyzes the investigations on dew formation made by Della Casu, Aitken, Russell and others. In the second part he presents his own observations (Oct. 1909 in Turin) of dew formation on

the surface of various plants at different heights above the surface and with varying weather conditions. *Subject Headings:* **1. Dew observation 2. Dew distribution with height 3. Turin, Italy.**

3D–73 551.586 551.574.41:632

Reed, Howard S., **Does Phytophthora infestans cause tomato blight?** *Phythopathology*, Baltimore, 2(6):250–252, Dec. **1912.** 2 refs. **DA**—Discussion on the relation between meteorological conditions and plant diseases. The author concludes that diseases of potatoes and tomatoes are connected with cooler temperatures and abundant formation of dew. *Subject Headings:* **1. Dew effects 2. Plant diseases.**

3D–74 551.508.74(42)

Skinner, Sidney, **The drosometer, or measurer of dew.** *Royal Meteorological Society, Quarterly Journal*, 38(162):131–136, April **1912.** fig., 3 tables, refs. Summary in: *Meteorological Magazine*, London, 47(556):73, May **1912. DLC**—Description of an instrument for the measurement of dew. A cup 11.2 cm in diameter, with total surface of 98 cm^2 is exposed to the sky. The author was the first to use a drosometer to measure regularly the amount of dew. Observations with this drosometer at Little Baddaw, Essex and at Saint Leonards, Sussex in 1909–1911, emphasized the intensity of dew in these places. *Subject Headings:* **1. Drosometers 2. Dew observation 3. Essex, England 4. Sussex, England.**

3D–75 551.574.41:551.506(42)(729)

Skinner, Sidney, **The measurement of dew.** *Meteorological Magazine*, London, 47(557):99–100, June **1912. DLC**—In response to a suggestion that rain gages rather than drosometers could be used to measure dew, the author points out that drosometer measurements are of importance both to the civil engineer in determining the amount of water that can be collected by radiative processes and to the meteorologist in studying the heat budget of the earth. Advantages of using drosometers and rain gages simultaneously are pointed out. *Subject Headings:* **1. Dew 2. Drosometers 3. Rain gages.**

3D–76 551.574.41:551.521.2(68)

*Sutton, J. K., **On some meteorological conditions controlling nocturnal radiation.** *Royal Society of South Africa, Transactions*, Vol. 2, Pt. 5:381–393, Sept. 26, **1912.** 10 tables, 5 refs. **DLC**—Observations of radiation processes made at Kimberley during a period of eight years show that, after state of the sky and movement of the air, relative humidity is an important factor determining the magnitude of the radiation-temperature gradient. The author presents many tables characteristic of these conditions (frequency of dew, radiation, temperature difference corresponding to grade of relative humidity, wind movement, etc.). It is remarkable that the author's observations on 27 clear nights showed no decrease in the radiation-temperature gradient during dew formation. *Subject Headings:* **1. Nocturnal radiation 2. Dew formation 3. Dew data 4. Kimberley, South Africa.**

1913

3D–77 551.574.41 551.574.42

Eckardt, B., **Eistau.** [Ice dew.] *Meteorologische Zeitschrift*, 48(2):106, Feb. **1913. DWB**—When the temperature dropped to −1.0°C, dew, which had formed in a small wooded area, turned to hoar frost, whereas in exposed areas it became rime. *Subject Headings:* **1. Dew 2. Hoar frost 3. Rime.**

3D–78 551.574.41

Godden, William, **The genesis of dew.** *Meteorological Magazine*, London, 48(573):163, Oct. **1913. DLC**—The author describes his experiments made in 1912 in England. He used a set of three shallow, thin glass trays 8″ x 6″: one placed on grass, hollow side up (measurement of moisture from atmosphere); the second inverted over grass close to the first and the third inverted over a bare patch of garden soil nearby (measurement of moisture which rose as vapor from the soil). Moisture collected on blotting paper showed that about 25% was precipitated from the atmosphere, about 60% was given off by the grass and the remaining 15% was vapor from the soil. *Subject Headings:* **1. Dew sources 2. England.**

3D–79 551.574.41:551.594.12(45)

Negro, Carlo, **Sulla formazione della rugiada.** [On dew formation.] *Accademia Nazionale dei Lincei, Rome, Atti, Sessione 6*, 6:1–6, May 18, **1913.** refs. **DLC**—An analysis of observations made at Turin in 1909 on dew and hoar frost formation. The author shows the possibility of the influence of dew formation on the electrical state and ionization of the atmosphere. *Subject Headings:* **1. Dew observation 2. Electrical properties of dew 3. Ionization 4. Turin, Italy.**

3D–80 551.508.74 551.506:551.574.41(729)

Pickering, William H., **A year's record with a dew recorder at Mandeville, Jamaica.** *Royal Meteorological Society, Quarterly Journal*, 39(168):326–327, Oct. **1913.** table. **DLC**—A new dew recorder, constructed in 1901 by Prof. W. H. PICKERING, for observations at Jamaica during 1912–1913, was used with satisfactory results. This instrument has a square, blackened iron funnel 60 cm on a side and 10 cm in depth, and is supported in a wooden box at a height of 50 cm above the soil surface. During May 1912–April 1913 (period of observation) there were only 10 totally cloudy days (7 days in November). The nights were usually cloudless and dew deposits were very heavy. Two hundred and ninety-seven nights with dew were observed in this period, the annual amount of dew precipitation was 3.39 cm, mean per night 0.0116 cm and maximum 0.040 cm. *Subject Headings:* **1. Dew data 2. Drosometers 3. Mandeville, Jamaica.**

1914

3D–81 551.5(058)

Pulkovo. Astronomicheskaia Observatoriia, Annals. 1854–1914. Title varies. **DLC, DWB, NN**—Remarks on dew observations made at and between scheduled hours. *Subject Headings:* **1. Dew data 2. U.S.S.R.**

3D–82 551.574.41:551.506.3:551.574.42(436)

*Topolansky, Moritz, **Der Reif und Tau in Österreich bis 1100 m Seehöhe.** [Hoar frost and dew in Austria up to 1100 m above sea level.] *Austria, Zentralanstalt für Meteorologie und Geodynamik, Jahrbücher, Neue Folge* 1912, 49:1–18, **1914.** numerous figs., table, 3 maps, append. **DWB**—A comprehensive work on long period observations of dew in Austria. In the numerous tables, the author gives for the period 1895–1909 annual number of days with dew and hoar frost, and variation of the number of such days with height above sea level. *Subject Headings:* **1. Dew 2. Hoar frost 3. Austria.**

1916

3D–83 551.571:632 551.586

Orton, C. R., **Meteorology and late blight of potatoes.** *Phytopathology*, Baltimore, 6(1):107, Feb. **1916. DA**—This is an abstract of a paper presented at the 7th Annual Meeting of the American Phytopathological Society on Dec. 28–31, 1915. The author remarks that precipitation (including dew, hoar frost, etc.) alone has little importance, but high relative humidity in the latter part of July and in August is possibly the most important factor in determining the rapid spread of Phytophthora to produce an epiphytotis. *Subject Headings:* **1. Humidity effects 2. Potato blight.**

3D–84 551.508.74 551.574.41

*Tol'skiĭ, A., **Nabliudeniia nad rosami v Borovom opytnom lesnichestve (Samar. gub.).** [Observations on dew at the Borovoe experimental forest (Samara Province).] *Meteorologicheskiĭ Vestnik*, 26(6):161–167, June **1916.** 3 figs., 3 tables. **DWB** A dark red colored iron plate 50 x 40 cm was used as dew receiver, the balance of Wild's evaporator and the usual meteorological self-recorder were parts of author's drosometer. Results of observations during 1913, 1914, and 1915 are presented. The tables contain: number of days with dew for each month, monthly mean and diurnal variations of dew intensity. In this period the maximum daily amount of dew was 0.24 mm at Borovoe. *Subject Headings:* **1. Diurnal dew variations 2. Annual dew variations 3. Drosometers 4. Borovoe, U.S.S.R.**

1918

3D–85 551.574.41(4)

Parchinger, V., **Eine neue Taumessungsmethode.** [New method of dew measurement.] *Meteorologische Zeitschrift*, 35(1/2):47–48, **1918. DLC**—The author presents a method of measuring dew by means of blotting paper. After dew has formed, the blotting paper is pressed against the surface of grass, leaves, etc. Twenty-six days' observations at Akna Slatine (dry region) showed the mean amount of dew to be 0.06 mm per night. In Budluiz (Bucovina) the maximum was 0.17 mm and the mean 0.1 mm. *Subject Headings:* **1. Drosometers 2. Dew intensity 3. Bucovina, Romania.**

1921

3D–86 551.574 551.574.4

Köhler, Hilding, **Zur Kondensation des Wasserdampfes in der Atmosphäre. Erste Mitteilung.** [Condensation of water vapor in the atmosphere. Pt. I.] *Geofysiske Publikasjoner*, 2(1), **1921.** 15 p. fig., 2 tables, 7 refs. **Pt. II,** *ibid.*, 2(6), **1922.** 53 p. 15 figs., photo, 11 tables, 27 refs. **DLC**—Fundamental investigation of the condensation processes in the atmosphere. In the first part, the author analyzes empirical formulas for water vapor condensation and gives characteristics of the physical process of dew formation. He pays special attention to water vapor condensation by

temperatures below the freezing point and to ice crystal formation. Various forms of condensation (in clouds, fog, dew and ice crystals) and methods of investigating them are discussed in Pt. II. *Subject Headings:* **1. Condensation 2. Dew formation 3. Ice crystal formation.**

3D–87 551.574.4(45)

*Passerini, Napoleone, **Un dodicennio di osservazioni drosometriche.** [Twelve years of drosometric observations.] *Congresso Internazionale di Meteorologia, Venezia, Settembre 1920, Atti,* **1921.** p. 112–127. tables, refs. **DWB**—A report on special measurements of dew and hoar frost in Florence made during 1897–1908. The tables contain characteristics of monthly and annual variations of dew and hoar frost. The conditions of dew and hoar frost formation are discussed. Chemical analysis showed that one liter of dew contained from 0.1 to 0.4 mg of ammonia, from 0.3 to 8.0 mg of nitric anhydride and from 0.02 to 0.5 mg of nitrous anhydride. *Subject Headings:* **1. Dew variations 2. Dew analysis 3. Hoar frost 4. Florence, Italy.**

1922

3D–88 551.574.41

Talman, Charles Fitzhugh, **Meteorology. The science of the atmosphere.** New York, **1922.** Vol. 1. 384 p. figs. **DLC**—On p. 371 the author defines dew as atmospheric moisture condensed in liquid form on objects cooler than the air (especially at night). *Subject Headings:* **1. Dew formation.**

1923

3D–89 551.574.41

Aristotle, **Meteorologica.** [Meteorology.] Trans. by Erwin Wentworth Webster. Oxford, Clarendon Press, **1923.** 140 p. numerous refs. **DLC**—ARISTOTLE (Book 1, Chap. 10) paid special attention to the causes of dew and hoar frost and indicated that dew is vapor condensed into water. Except in cold weather, dew forms when the sky is clear and the air still. Some of the vapor which forms during the day rises only slightly and then becomes dew under the influence of nocturnal cooling. *Subject Headings:* **1. Dew formation 2. History of meteorology. I. Webster, Erwin Wentworth** (*trans.*).

1924

3D–90 551.508.74

Andrianov, P. J., **Rosomer-areometr.** [Drosometer-areometer.] *Nauchnyĭ Agronomicheskiĭ Zhurnal,* Moscow, 1(9/10):630–633, **1924.** figs., table, refs. **DLC**—Description of a new model of KERNER's dew meter. Observations made by the Moscow Meteorological Observatory in the summer of 1924 show that the quantity of dew was greater over uncultivated than over cultivated soils. *Subject Headings:* **1. Drosometers 2. Dew observation 3. Moscow, U.S.S.R.**

3D–91 551.508.71

Holzmann, Mark, **Eine neue Methode zur Bestimmung der Temperatur des Taupunktes.** [A new method of dew point determination.] *Physikalische Zeitschrift.* Leipzig, 25(18):443–445, Sept. 15, **1924.** 2 figs. **DLC**—A description of two new instruments by which the dew point is determined with a thermocouple and cooling fluid. *Subject Heading:* **1. Dew point measurement.**

3D–92 551.574.41

Lloyd, John Uri, **A study in pharmacy. Nature's percolation processes in connection with the formation and excretion of dew, versus artificial percolation.** *American Pharmaceutical Association, Journal,* 13(5/6):407–519, May/June **1924.** 19 figs., numerous refs. Abstracted from reprint. **DWB**—This paper contains a summary of the author's work and experiments which were made during a long period (from 1879). The problem of water secretion by plants, the relationship between the moisture in the atmosphere and the moisture evaporated from the earth, and the conditions of dew formation are studied in detail. *Subject Headings:* **1. Moisture exchange 2. Dew formation.**

3D–93 551.574.41(4)

*Shaw, Sir William Napier, **Manual of meteorology.** Cambridge, University Press, **1924.** Vol. 3. **MH-BH**—On p. 188, 217, 282–283, 323–325 and 328, the author gives a brief but exhaustive study in which he describes the principal problems of dew formation. The development of the theory of dew formation from WELLS (1814) to the present is reviewed. In the summary on dew measurements he shows that the annual amount of dew precipitation in London is 1–1.5 in. (according to GEORGE DINES), at Tenbury in Worcestershire, 1.6 in. (according to BADGLEY), at Munich 1.2 in. (according to WOLLNY) and at Montpellier, France, 0.3 in. (according to CROVA). *Subject Headings:* **1. Dew formation 2. Dew data 3. History of meteorology 4. England 5. Germany 6. France.**

1925

3D–94 551.508.7

†Great Britain. Dept. of Scientific and Industrial Research. Food Investigation Board, **The measurement of humidity in closed spaces.** *Great Britain, Dept. of Scientific and Industrial Research, Food Investigation Board, Special Report* No. 8, **1925.** 54 p. 36 figs., 9 tables, 61 refs. **NN**—Detailed description of methods used for measuring humidity, including chemical hygrometers, wet and dry bulb hygrometers, dew point hygrometers, hygrometers based on the principle of observation of the change of reflecting power by dew deposit or on variation of electrical resistance of the surface film with dew deposit, hair hygrometers, etc. *Subject Headings:* **1. Drosometers 2. Hygrometry.**

3D–95 551.586:632

Löhnis, Marie P., **Onderzoek naar het verband tusschen de weergesteldheid en de aardappelziekte (Phytophthora infestans) en naar de eigenschappen, die de votbaarheid der knollen voor deze ziekte bepalen.** [Research on the relation between weather conditions and potato blight (Phytophthora infestans) and on the conditions that determine the susceptibility of turnips to this blight.] *Wetensche Commission voor Advies en Onderzoek in het Belang van de Volkswelvaart en Weerbaarheid, Mededeelingen,* [1925.] 129 p. 4 plates, 24 figs. Unchecked. Review by Wiltshire in: *Royal Meteorological Society, Quarterly Journal,* 57(240):304, **1931. DWB**—Weather conditions immediately preceding outbreaks of potato blight (Phytophthora infestans) during the years 1919–1923 were studied. The author concludes that there is no definite correlation between outbreaks of the disease and such weather factors as dew, vapor pressure, temperature, relative humidity and rainfall frequency and amount. *Subject Headings:* **1. Potato blight 2. Meteorological elements.**

3D–96 551.574.41

Puishe, Edmund Pavlovich. **Kogda otlagaetsia bol'she vsego rosy?** [When does the largest amount of dew precipitate?] *Meteorologicheskiĭ Vestnik,* 35(9):204–205, Sept. **1925.** 2 refs. **DWB**—The author remarks that in central and southern Russia the annual amount of dew reaches 2–3% of the total amount of precipitation. He approves of V. Parchinger's method of dew measurement. *Subject Headings:* **1. Dew intensity 2. Drosometers 3. U.S.S.R.**

3D–97 551.574.41:551.521.2

Tochidlovskiĭ, I., **K voprosu o rose.** [On the problem of dew.] *Meteorologicheskiĭ Vestnik,* 35(12):277–278, Dec. **1925.** 2 refs. **DWB**—Analysis of the conditions of dew formation. The author shows that radiational cooling is a very important factor in the formation of dew. *Subject Headings:* **1. Dew formation 2. Nocturnal radiation.**

1926

3D–98 551.508.74

Andrianov, P. I., **Rosopisets-areometer.** [Drosometer-areometer.] *Nauchnyĭ Agronomicheskiĭ Zhurnal,* Moscow, 3(10):661–663, **1926.** 3 figs. English summary. **DLC**—The new drosometer, which was constructed after two years of investigation and experimentation is described. Observations made at the Moscow Observatory during May-July 1926 showed that the maximum dew deposition took place during the hour after sunrise. (For German version *see* No. 102 below). *Subject Headings:* **1. Drosometers 2. Dew observation.**

3D–99 551.574.41

Pick, W. H., **A short course in elementary meteorology.** 2nd rev. ed. London, Meteorological Office, **1926.** 117 p. 20 figs., 14 tables, numerous refs. **NN**—On p. 28–31 a description of conditions of dew formation and a brief history of new developments concerning this problem are given. *Subject Heading:* **1. Dew formation.**

3D–100 551.574.41(4)

Raymond, G., **Sur la mesure et l'enrégistrement de la rosée à Antibes (Alpes-Maritimes).** [On measurement and recording of dew at Antibes (Maritime Alps).] *La Météorologie,* 2:464–465, **1926. DWB**—Description of the methods used for measuring the amount of dew at Antibes during 7 years of observation (1920–1926). *Subject Headings:* **1. Dew measurement techniques 2. Antibes, France.**

3D–101 551.586 551.574.41:632

van Everdingen, E., **Het verband tusschen de weergesteldheid en de aardapperlziekte. (Phytophthore infestans.)** [Correlation between weather conditions and potato blight.] *Tijdschrift over Plantenziekten,* Amsterdam, 32(5):129–140, **1926.** Review in: *Royal Meteorological Society, Quarterly Journal,* 57(240):304–305, July **1931. DLC**—Results of the author's investigation of the

relation between weather conditions and outbreaks of potato blight. The following four conditions appeared to be necessary for the outbreak of potato blight: 1) dew occuring for at least four hours during the night, 2) minimum night temperature not lower than 50°F, 3) mean cloudiness not less than 0.8 on the day following the dew and 4) rainfall of at least 0.1 mm on the day following the dew. *Subject Headings:* **1. Dew effects 2. Potato blight.**

1927

3D–102 551.508.74(47)

*Andrianov, P. I., **Tauregistrier-Aräometer.** [Drosometer-areometer.] *Meteorologische Zeitschrift*, 44(11):425–429, Nov. **1927.** 3 figs., 2 tables, 5 refs. **DWB**—A description of a drosometer constructed by the author. A brief summary of investigations made by other authors and results of experimental measurements of dew amount made during the summer of 1924–1925 and 1926 at Petrovsko-Razumovskoe (near Moscow) are given. *Subject Headings:* **1. Drosometers 2. Dew data 3. Petrovsko-Razumovskoe, U.S.S.R.**

3D–103 551.508.74

Gamba, Pericle, **Un nuovo tipo "Drosografo" par lo studio della rugiada.** [New type of drosometer for the study of dew.] *Meteorologia Pratica*, 8(1):18–23, Jan./Feb. **1927.** 4 figs. **DWB**—Description of a drosometer designed by A. Slamoiraphi in Milan and based on the balance principle. The author remarks on the importance of dew observations for agriculture, hydrology, glaciology, etc. *Subject Heading:* **1. Drosometers.**

3D–104 551.574.41:551.506(4)

*Raymond, G., **Sur la mesure et l'enregistrement de la rosée à Antibes.** [On the measurement and recording of dew at Antibes.] *La Météorologie*, 3(27):241–246, June **1927.** 3 figs., 3 tables, 2 refs. **DWB**—The drosometer, constructed by the author, utilizes a modification of the balance principle of Roberwall. Observations with this instrument were made at Antibes during June 1920–Dec. 1926. Results show that variations in the amount of dew are very large and that dew precipitation depends on many meteorological factors. *Subject Headings:* **1. Dew data 2. Drosometers 3. Antibes, France.**

3D–105 551.574.41:016

†Sononi, Vishvanath Vishny, **Bibliography of meteorological papers in the publications of the Asiatic Society of Bengal 1788–1928.** *Asiatic Society of Bengal, Journal and Proceedings*, 23(3):455–502, **1927.** 405 refs. Abstracted from reprint. **DLC**—This bibliography includes items on dew, humidity and dew point. *Subject Headings:* **1. Dew 2. Bibliographies.**

3D–106 551.574.41(81)

Wegener, Kurt, **Bemerkung über Frühlings- und Herbsttau.** [Remark on spring and autumn dew.] *Meteorologische Zeitschrift*, 44(5):188, May **1927.** **DWB**—Observations of dew made on a farm near Porto Alegre (approx. 30°S lat.) show that the daily amount of dew may reach 5 mm. In the spring, dew condenses on the soil surface but in the autumn it precipitates on plant surfaces only while the soil surface remains dry. This phenomenon takes place because in spring the soil is colder than the air and in autumn it is warmer. *Subject Headings:* **1. Dew observation 2. Porto Alegre, Brazil.**

1928

3D–107 551.574.41(4)

*†Chaptal, Léon Émile, **Contribution à l'étude de la rosée et des sources secondaires de l'humidité du sol.** [Contribution to the study of dew and secondary sources of soil moisture.] *Annales de la Science Agronomique*, Nancy, 45(1):134–154, April May **1928.** 4 figs., tables, 61 refs. Abstracted from reprint. **DWB.** Review in: *La Météorologie*, 6:200–203, 1930. **DWB**—A survey of the measurements of dew amount in France and northern Italy. In Antibes the maximum annual amount of dew reached 43 mm, in Montpellier it was 36 mm. (First series of observations by the author gave 9.6 mm per year only.) In Florence the annual amount was 6.5 to 8.2 mm. Some remarks are made on dew as a source of soil moisture. *Subject Headings:* **1. Dew data 2. Dew intensity 3. Soil moisture 4. France 5. Italy.**

3D–108 551.574.41

Critikos, N. A., **Le phénomène de la rosée, méthode pour étudier son mode de formation.** [Phenomenon of dew, method of investigating its formation.] *Athens, Observatoire National, Annales*, 10:14–16, **1928.** fig., refs. **DLC**—Investigations of dew formation showed that drops of dew can be formed in the air. The number of dew drops and their size depend on the intensity of cooling. *Subject Heading:* **1. Dew formation.**

3D–109 551.574.41(09)

Free, Edward Elway and Hoke, Travis, **Weather.** New York, Robert M. McBride and Co., **1928.** 337 p. numerous figs. **DLC** In Chap. 13 entitled "Dew and frost" (p. 167–180, 5 figs.) the authors give the history of the development of scientific views on dew and the nature of its formation. They emphasize WELLS' classic theory of dew according to which: ". . . the chief thing to be said about dew is that it doesn't fall early or late. . . . In fact, it rises. . . . The dew is reproduced whenever warm, moist air from any source comes in contact with colder things." *Subject Headings:* **1. Dew formation 2. History of meteorology 3. Wells' dew theory.**

3D–110 551.506:551.574.41(93)

*Visser, S. W., **Dauwmetingen te Batavia.** [Dew measurements in Batavia.] *Natuurkunding Tijdschrift voor Nederlandsch-Indie*, Batavia, 88(3):229–251, **1928.** 2 figs., 10 tables, 11 refs. Review in: *Meteorologische Zeitschrift*, 47(5):195–196, **1930. DLC** In the observatory of Batavia in special measurements of dew amount were made in 1926–1927, for this investigation the author worked out a method of observation and computation. The problem of water balance during dew formation was studied. The mean amount of dew during the easterly monsoon (July–August 1927) was 0.15 mm during the night, the maximum was 0.27 mm; during the westerly monsoon the mean amount was 0.25 mm and the maximum 0.33 mm. On the average, 0.11 mm of dew precipitated to the soil surface. *Subject Headings:* **1. Dew data 2. Dew intensity 3. Drosometers 4. Batavia, Java.**

1929

3D–111 551.574.41

Cohen, J. B., **Dew: Does it rise or fall?** *Nature*, London, 124(3126):482, Sept. 28, **1929. DLC**—The author supports the opinion of JOHN AITKEN that *real* dew rises as vapor from the ground and condenses on cold surfaces near the ground. As an example he cites a hard gravel path, the material of which loses its temperature slowly so that there is no visible condensation. Leaves give off their heat after sundown from the upper surface and condensation is observed on the under surface only. Another form of dew, a *false* dew, is caused by cold air which forms during radiation and flows from a higher to a lower level. The observations made at the top of Coniston Old Man (2633 ft) show that the grass was dripping with moisture at the foot of the mountain but that on the top it was as dry as on a warm summer day. *Subject Headings:* **1. Dew formation 2. Dew sources.**

3D–112 551.574.41:551.594.12

Critikos, N. A., **Über die Struktur des Taues.** [On the structure of dew.] *Beiträge zur Geophysik*, 21(1):33–35, **1929.** fig. **DLC**—The author made some experiments on the problem of dew formation. He observed the formation of dew on plain white paper, covered with soot. The results of his investigation show that dew drops can form in the air layer near the ground as well as on the surfaces of grass, stones, leaves, etc. The drops of dew are larger than the drops of fog or clouds. Ionization conditions of the atmosphere are also important for dew formation. *Subject Headings:* **1. Dew formation 2. Ionization.**

3D–113 551.574.41(09)

Dudley, Jane, **Winter crystals and other marvels.** Whitinsville, Mass., Eagle Press, **1929.** 127 p. numerous figs. **DWB**—On p. 107–121 seven illustrations of various types of dew formation are given. The text contains extracts from various works published by writers of two centuries. *Subject Headings:* **1. Dew formation 2. History of meteorology.**

3D–114 551.506:551.574.41

*Gamba, Pericle, **Sulla formazione della rugiada ed il risultato di alcune misure drosometriche.** [On dew formation and some results of drosometer measurements.] *Società Meteorologica Italiana, Bolletino Bimensile*, Mondovi, 48(3):58–69, **1929.** tables, 3 refs. **DWB** The work contains results of measurements of dew amount made during the summer of 1929 by the geophysical observatory in Pavia. Tables give hourly amount of dew measured by 3 drosometers, and attendant wind and cloud conditions. *Subject Headings:* **1. Dew data 2. Drosometers 3. Pavia, Italy.**

3D–115 551.574.41

Martin, Edward, **Dew: Does it rise or fall?** *Nature*, London, 124(3127):513, Oct. **1929. DLC**—The author's observations verified BLYTHE's and AITKEN's views that the source of dew is water vapor from the ground because dew is deposited on the under sides of radiating materials (grass, stones, feathers, cottonwool, etc.). *Subject Heading:* **1. Dew sources.**

3D–116 551.574.41

Maxwell, Herbert, **Dew: Does it rise or fall?** *Nature*, London, 124(3124):412, Sept. 14, **1929. DLC**—Some remarks on the problem of dew formation. The author does not share the opinion

that dew rises which was expressed by E. E. Free and Travis Hoke in their paper (*see item* 3D–109 above). They disregard the fact that dew can be formed only on clear nights. The author agrees that water vapor rises but dew can only be described as falling. *Subject Heading:* **1. Dew sources.**

3D–117 551.574.41

Simpson, G. S., **Dew: Does it rise or fall?** *Nature*, London, 124(3128):578, Oct. 12, **1929.** 2 refs. **DLC**—Brief analysis of the conditions of dew, fog and mist formation by radiational cooling on a clear night. Dew is formed on bodies near the ground when their temperatures fall below the dew point. If the temperature of the air falls below its dew point, mist or fog appears. "The dew is nowhere until it appears on the surface; it therefore neither rises nor falls." *Subject Heading:* **1. Dew formation.**

1930

3D–118 551.574.41:551.506:581.055(431/5)

†*Hiltner, E. D., **Der Tau und seine Bedeutung für den Pflanzenbau.** [Dew and its importance for plant cultivation.] *Archiv für Pflanzenbau*, Berlin, 3(1):1–70, Feb. 11, **1930.** 14 figs., numerous tables, 80 refs. **DWB**—Description of meteorological conditions associated with dew formation and its importance to climate and vegetation. The author also analyzes comparative measurements of dew collected on surfaces with different properties, e.g. when the surface of a bronze sieve collected 72.9 mm, the amount of dew on pig's bristles was 83.9 mm and on a rubber sponge surface 186.7 mm. The time of weighing is important because late in the morning a part of the dew has already evaporated. Observations of dew and hoar frost were made at Munich from May to Sept. 1928. The total amount of precipitation during this 90-day period was 502.3 mm rain and 37.9 mm (or 7% rain precipitation) from dew and hoar frost. A special investigation showed that dew is a very important factor in plant cultivation and in supplying moisture to the soil. *Subject Headings:* **1. Dew data 2. Dew effects 3. Plant ecology 4. Soil moisture 5. Munich, Germany.**

1931

3D–119 551.508.71 551.571.1

Büdel, Anton D., **Die Feuchtigkeitsmessung in der Bodennaher Luftschicht.** [Humidity measurement in the air layer near the ground.] *Zeitschrift für angewandte Meteorologie*, 48(10):289–293, Oct. **1931.** 2 figs., 12 refs. **DWB**—Description of instruments for measuring humidity near the ground (hair hygrometers, anemometers, etc.) and remarks on the conditions observed during calibration. *Subject Headings:* **1. Humidity measurement techniques 2. Hygrometers 3. Micrometeorology.**

3D–120 551.574.41:581.055 551.586

Hiltner, E. D., **Der Tau und seine Bedeutung für den Wasserhaushalt der Kulturpflanzen.** [Dew and its importance for the water economy of cultivated plants.] *Praktische Blätter für Pflanzenbau, der Pflanzenschutz*, 8(10):223–233, **1931.** fig. **NN**—A study of the problem of dew formation. The author analyzes the problem of dew formation and concludes that dew is a very important factor for the water economy of plants, especially in regions with a small amount of precipitation. *Subject Headings:* **1. Dew formation 2. Dew effects 3. Plant ecology.**

3D–121 551.574.4

Robitzsch, Max, **Über Tau, Reif- und Raureifbildung.** [On dew, hoar frost and rime formation.] *Annalen der Hydrographie und Maritimen Meteorologie*, 59(5):171–174, May, **1931.** 2 refs., equations. **DLC**—Theoretical considerations and analysis of the equation presented by the author for the computation of conditions necessary for dew, hoar frost and rime formation. *Subject Heading:* **1. Dew formation.**

3D–122 551.586 551.574.41:632

Wiltshire, S. P., **The correlation of weather conditions with outbreaks of potato blight.** *Royal Meteorological Society, Quarterly Journal*, 57(240):304–316, July **1931.** 3 tables, 12 refs. **DLC**—Investigations were carried out to determine how far Dutch data (*see items* 3D–94 and 3D–101 above) could be applied to English conditions. Outbreaks of potato blight in England and Wales were investigated. The weather records (minimum temperature, estimated duration of dew, rainfall and sunshine) and the place of occurrence of the disease are given. The general conclusion is that in the greatest majority of cases these investigations confirm more or less van Everdingen's theory. *Subject Headings:* **1. Dew effects 2. Dew data 3. Potato blight 4. England.**

1932

3D–123 551.574.41 551.582(53, 661)

Brooks, Charles E. P., **Le climat du Sahara et de l'Arabie.** [Climate of the Sahara and of Arabia.] Paris, Société d'Éditions Géographique, Maritime et Coloniales, **1932.** 81 p. 17 figs.,

11 tables, refs. **NNA**—In this comprehensive study on the climate of these countries, dew is among the factors surveyed. (*Same item* as No. 2F-96 in June 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Dew 2. Sahara Desert 3 Arabia.**

3D–124 551.508.74 551.574.41:581.055

†*Leick, Erich, **Zur Methodik der relativen Taumessung.** [On the methodology of relative dew measurement.] *Beihefte zum Botanischen Centralblatt, Ergänzungsband,* Prague, 49:160–189, **1932.** Abstracted from reprint. **DWB**—In this extensive work, the author describes the physical conditions of dew formation and earlier methods used for measuring its amount. Farther, the method of measuring dew by means of gypsum and siliceous earth plates is described in detail. (This method is known as Leick's dew plate method.) Special observations were made by means of this method in 1931–1932 at the Botanical Garden in Greifswald under various weather conditions, plate exposures and heights above the surface. Measurements of hoar frost, fog, and rain precipitation were also made. *Subject Headings:* **1. Dew observation 2. Drosometers 3. Dew effects 4. Plant ecology 5. Greifswald, Germany.**

3D–125 551.574.41

Suzuki, Seitaro and Huduysi, Ōmori, **The anomalous variation of the electrical conductivity of glass surfaces and the mechanism of dew formation.** *Geophysical Magazine,* Tokyo, 6:377–386, March **1932.** 10 figs., 4 refs. In English. **DWB**—In this experimental work, the mechanism of dew formation is investigated. It was found that water vapor condenses on a glass surface, forming a thin film which thickens with increasing relative humidity. At the dew point, the film dissolves and fine drops form suddenly. *Subject Headings:* **1. Dew formation 2. Drosometers.**

3D–126 551.574.41:581.055 551.584.4

*Zattler, Fritz, **Agrarmeteorologische Beiträge zum Tauproblem auf Grund von Messungen im Hopfengarten. Zugleich eine Untersuchung über das Sonderklima des Hopfens.** [Agro-meteorological contribution to the problem of dew on the basis of measurements in a hop field. Simultaneously an investigation of the special climate of hops.] *Archiv für Pflanzenbau,* 8(3):371–404, **1932.** 5 figs., numerous tables, 12 refs. Abstracted from reprint. **DWB**—During summer and autumn of 1930 observations on the amount of dew were made in a hop field near Munich at heights 0.15 m to 6.80 m above the surface and with varied vegetation. In conclusion, the author analyzes the correlation between weather conditions (temperature, humidity, wind and cloudiness) and the intensity of dew formation, and indicates that dew is an important factor for plant and water economy. *Subject Headings:* **1. Dew distribution with height 2. Dew effects 3. Plant ecology 4. Microclimatology.**

1933

3D–127 551.508.74

Bujorean, Gh., **Beiträge zur Methodik der Taumessung.** [Contributions to the methodology of dew measurement.] *Geobotanisches Forschungsinstitut Rübel in Zürich, Bericht für das Jahr 1932,* **1933.** p. 52–67. 16 figs. **DA**—Experimental investigations were made in the Rübel Institute with various drosometers. The author analyzes the results obtained and establishes the defects of the methods used. *Subject Headings:* **1. Dew measurement techniques 2. Drosometers.**

3D–128 551.574.41(682)

Keller, H., **Über Taumessungen im ariden Hochland Transvaals.** [On dew measurements in arid plateau of the Transvaal.] *Meteorologische Zeitschrift,* 50(9):321–324, Sept. **1933.** 2 figs., 5 refs. **MH-BH**—A brief description of investigations made in the Pretoria experimental field (elevation 1290 m). Absorbent paper was used for the measurement of amount of dew. The mean quantity of dew on the surface covered with yellow grass (normal cover for this region) was 0.08 mm per night (100% of mean rainfall), more dew was observed on green grass (175%). On the surface with overgrown yellow grass, the quantity of dew was only 25% and on bare soil it was 0%. *Subject Headings:* **1. Dew measurement 2. Dew intensity 3. Cover influences 4. Pretoria, South Africa.**

3D–129 551.574.41:581.055(431/5)

†Leick, Erich, **Der Tau als Standortsfaktor.** [Dew as a factor of local conditions.] *Deutsche Botanische Gesellschaft, Berichte,* Berlin, 51(10):409–442, Jan. 25, **1933.** 15 figs., 2 tables, 40 refs. **DLC.** Review in: *Naturwissenschaften,* 22(29):498–499, July 20, **1934. DLC**—Observations on dew were made at Hiddensee (German experimental station) under various weather conditions with Leick's dew plates. The amount of dew varied with relative humidity, height above surface, state of grass cover, color of soil, location of the observation point, etc. The author gives a comprehensive review of the investigations of the measurements of dew formation. *Subject Headings:* **1. Dew formation 2. Drosometers 3. Cover influences 4. Hiddensee Island, Germany.**

1934

3D–130 551.574.41

Arens, K., **Die kutikuläre Exkretion des Laubblattes.** [Cuticular excretion of foliage.] *Jahrbücher für Wissenschaftliche Botanik*, Berlin, 80(2):248–300, Aug. **1934.** 14 tables, 93 refs. **DA**—Precipitation and dew contain many mineral salts (K, Ca, Mg, P) and some organic substances. HIETHER'S theory of dew formation and of the importance of salts in its formation is correct according to the author. *Subject Heading:* **1. Dew analysis.**

3D–131 551.508.74

Delcambre, M., **Rosécope enregistreur.** [Drosometer recorder.] *La Météorologie*, 10:451–454, Sept. **1934.** 3 figs. **DWB**—Description of a new drosometer. The drops of dew are condensed on the surface of a funnel and fall on a receiving surface. This instrument records the time when dew begins to form and the relative intensity of its formation. *Subject Heading:* **1. Drosometers.**

3D–132 551.508.74:551.584.41

Fritzsche, Günter, **Vergleichende Messungen mit Leickschen Tauplatten.** [Comparative measurements with Leick's dew plates.] *Bioclimatische Beiblätter der Meteorologischen Zeitschrift*, 1(2):66–73, **1934.** 6 tables, 10 refs. **DWB**—Simultaneous observations of dew were made by means of LEICK'S method during the vegetative period of 1933 at Hiddensee island in the Baltic) at various heights above the surface and under different weather conditions. The minimum amount of dew was found at heights up to 50–90 cm above the soil surface. Local variations of dew intensity depend on the state of the soil surface (grass, bare surface, color, etc.). *Subject Headings:* **1. Dew observation 2. Dew distribution with height 3. Microclimatology 4. Hiddensee Island, Germany.**

3D–133 551.574.41:551.521.2

Pasteur, ——, **La rosée, la radiation thermique terrestre et l'hydrogénèse du sol.** [Dew, thermal terrestrial radiation and soil hydrogenesis.] *Revue Scientifique*, Paris, 72(8):240–244, April 28, **1934.** 9 figs. **NN**—The author gives a review of the principal works on the problem of dew formation and thermal conditions related to it. The relation between radiation processes and the origin of soil moisture is studied. *Subject Headings:* **1. Dew formation 2. Radiation 3. Soil moisture.**

3D–134 551.574.41:551.584.41(47)

Skriabin, M. J. and Semenov, A. E., **Mikroklimaticheskie izmereniia na Voronezhskoĭ Geofizicheskoĭ Observatorii.** [Microclimatic measurements at the Voronezh Geophysical Observatory.] *Klimat i Pogoda*, No. 3(54):18–19, **1934.** 2 tables. **DWB**—During the summer of 1932 quantitative measurements of dew were made by means of blotting paper and observations of minimum temperature were recorded. Lowest temperatures and maximum amounts of dew were observed at the edge of the forest, whereas highest temperatures and 10–19% less dew occurred within the forest. *Subject Headings:* **1. Microclimatology 2. Dew distribution with height 3. Forest influences 4. Voronezh, U.S.S.R.**

3D–135 551.508.74:551.506(93)

Visser, S. W., **Ein neuer Tau-Registrierapparat.** [A new drosometer.] *Meteorologische Zeitschrift*, 51(10):388–390, Oct. **1934.** fig., 15 refs. **MH-BH**—Special observations on the formation of dew were conducted during 1926–1928 in Batavia. On the basis of these observations, the author concludes that minute variations of meteorological variables can cause a great difference in the amount of dew. Methods used before for the measurement of dew amount were not accurate. The new drosometer constructed by the author is a modification of the common hair hygrograph. *Subject Headings:* **1. Drosometers 2. Dew observation 3. Batavia, Java.**

1935

3D–136 551.574.4

Kähler, K., **Messung der Kondensationskerne und der Kondensationsprodukte. g) Messung des von Nebel, Rauhfrost und Tau herrührenden Niederschlags.** [Measurement of condensation nuclei and condensation products. g) Measurement of fog, rime and dew precipitation.] (In: **Handbuch der meteorologischen Instrumente und ihrer Auswertung.** [Handbook of meteorological instruments and their application.] Ernst Kleinschmidt (*ed.*). Berlin, Julius Springer, **1935.** p. 287–288.) **DLC**—Brief description of the most popular methods of measuring fog, rime and dew. *Subject Headings:* **1. Dew measurement techniques 2. Drosometers. I. Kleinschmidt, Ernst** (*ed.*).

3D–137 551.574.41 551.578.11

Lansberg, Thusnelda. **Quantitative Untersuchungen über die kutikuläre Exkretion des Laubblattes.** [Quantitative investigations on cuticular excretion of foliage.] *Jahrbücher für Wissenschaftliche Botanik*, Berlin, 81 5):769–806, May **1935.** 5 figs., 11 tables, 30 refs. **DA**—A study on the variation of the amount of salt deposited on the surface of foliage by rain, dew and fog. *Subject Headings:* **1. Dew analysis 2. Precipitation analysis.**

1936

3D–138 551.574.41(569/4)

Ashbel, Dov. **On the importance of dew in Palestine.** *Palestine Oriental Society, Journal*, Jerusalem, 16(4):316–321, **1936.** 2 tables, 6 refs. **NN**—A study of the conditions of dew formation in Palestine and its importance for the development of plants. Observational data on dew for the period 1933–1935 are given. *Subject Headings:* **1. Dew formation 2. Dew data 3. Plant ecology 3. Palestine.**

3D–139 551.574.41

†Pantanelli, Enrico. **Condensazione del vapore acqueo nel terreno.** [Condensation of water vapor near the ground.] *Meteorologia Pratica*, 17(5):217–235, Sept./Oct. **1936.** numerous tables, 51 refs. **DWB** Review of many works on this problem. Daily variations of dew formation and moisture economy of soil are studied. *Subject Headings:* **1. Dew formation 2. Diurnal dew variations 3. Soil moisture.**

3D–140 551.574.41

Saposhnikova, Serafima A., **Rosa kak meteorologicheskiĭ faktor.** [Dew as meteorological factor.] *Trudy po Sel'sko-khozaĭstvennoĭ Meteorologii*, No. 24, **1936.** Unchecked. *Subject Heading:* **1. Dew.**

3D–141 551.574.41(439.1)

Steiner, Lajos and Fleischman, Rudolf, **Taumessungen in Kompolt am nördlichen Rande der grossen ungarischen Tiefebene.** [Dew measurements at Kompolt at the northern edge of the great Hungarian Plain.] *Hungary, K.) Ungarische Reichsanstalt der Meteorologie und Erdmagnetismus, Veröffentlichungen*, Vol. **12, 1936.** 28 p. 11 figs., tables, 15 refs. In Hungarian and German. **DWB**—A review and analysis of observations on dew amount made at Kompolt during 1931–1934. For these measurements HILTNER's drosometer was used. The relation between intensity of dew and weather conditions, the height above the soil surface, and the state of the surface are studied. *Subject Headings:* **1. Drosometers 2. Dew intensity 3. Kompolt, Hungary.**

3D–142 551.508.74

Voznesenskiĭ, Arkadiĭ Viktorovich, **Ob izuchenii rosy.** [On the study of dew.] *Klimat i Pogoda*, No. 4 67):13–15, **1936.** 3 tables, 3 refs. **DWB**—Review of the principal works on the problem of dew measurement. The author pays special attention to LEICK's drosometer. *Subject Headings:* **1. Dew measurement 2. Drosometers.**

3D–143 551.574.41:581.055 551.586

Wangerin, W., **Ökologische Taumessung.** [Ecological dew measurement.] *Naturwissenschaften*, Berlin, 24(12):191–192, **1936.** 8 refs. **DLC**—A review of experimental investigations of dew measurements made in Germany. Dew amount is very important in the growth of vegetation, especially in arid regions. But the dew amount, measured by various drosometers, does not show the quantity of dew absorbed by a plant. HILTNER computed a special "Pflanzenfaktor" (plant factor) by means of which it is possible to determine the amount of dew absorbed by plants. *Subject Headings:* **1. Dew effects 2. Plant ecology.**

3D–144 551.508.74

Yamamoto, G., **The measurement of the amount of dew at Hukuoke, Japan.** *Geophysical Magazine*, Tokyo, 10:265–268, **1936.** 3 figs., table. Continued in: *ibid.*, 11:91–96, **1937. DWB**—Description of a new dew meter based on automatic recording of the weight of dew formed on a glass pan with a diameter of 7.6 cm. Observations with this drosometer were made at Hukuoke from April 1934 to March 1935. The daily and monthly variations of dew amount for this period are given in 2 diagrams and a table. *Subject Headings:* **1. Drosometers 2. Dew variations 3. Hukuoke, Japan.**

1937

3D–145 551.508.74

Koliasev, F. E. and Pivovarova, N. A., **Usloviia kondensatsii vodianykh parov vozdukha.** [Condensation of atmospheric water vapor.] *Meteorologiia i Gidrologiia*, No. 7: 62–67, July **1937.**

3 figs., 2 tables, ref. **DLC**—An experimental study describing investigations of the optimum conditions for condensation. A. P. ALEKSANDROV's method of recording the precipitation of dew is presented. In this method the light reflected from the mirror surface on which dew formed is measured with a selenium cell. Temperature variations of the mirror body are measured by means of special thermocouples soldered on the mirror. *Subject Headings:* **1. Condensation 2. Drosometers.**

3D–146 551.574.41(439,1)

Steiner, Lajos, **Une relation remarquable entre la quantité de la rosée et sa distribution avec la hauteur.** [A remarkable relation between the quantity of dew and its distribution with height.] *La Météorologie*, 3rd Ser., No. 1:1–7, Jan.–Feb. **1937.** fig., 4 tables, refs. **DWB**—Heights up to 200 cm gave a good correlation coefficient between the amount of dew and humidity. The measurement of dew amount was made at Kompolt at 0.15, 1.0 and 2.0 m above the soil surface. The author determines the dependence of dew formation upon seasons and weather conditions. Review by A. PITTORINO in *Rivista di Meteorologia Aeronautica*, 2(1):124–6, 1938. *Subject Headings:* **1. Dew formation 2. Dew distribution with height 3. Kompolt, Hungary.**

3D–147 551.574

Tugarinov, V. V. and Masalitin, N. P., **Opyty kondensatsii vodianykh parov vozdukha.** [Experiments on the condensation of atmospheric water vapor.] *Meteorologiia i Gidrologiia*, No. 1:72–77, Jan. **1937.** fig., 6 tables. English summary p. 77. **DLC**—A description of the first experimental condensation plant for obtaining water from the air. This plant was established in 1936 at the Timiriasev Agricultural Academy near Moscow. Observations showed that condensation took place even at such small differences of temperature as 3–4°C between the air in and outside the plant. *Subject Headings:* **1. Condensation processes 2. Artificial condensation plants 3. Moscow, U.S.S.R.**

3D–148 551.508.7

White, George Edwin, **A new apparatus for the precise and accurate determination of dew point.** Thesis (Ph.D.)—Columbia University, New York, **1937.** 36 p. 5 figs., 6 charts, 2 tables, 24 refs. **DLC**—The author describes the design of a dew point determination apparatus in which temperature errors due to temperature gradient and observational errors of the presence or absence of dew on a dew mirror are minimized. Diagrammatic drawings of the apparatus and of its individual parts such as the dew chamber, thermocouple installation and the optical system are given, and the technique of its use is outlined. This apparatus gives an accuracy of about ±0.01° C at 90% R.H. and ±0.05°C at 100% R.H. *Subject Heading:* **1. Dew point hygrometers.**—*I. L. D.*

3D–149 551.574.41

Yamamoto, G., **On the rate of condensation of dew.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 15(1):1–5, Jan. **1937.** In Japanese, English summary p. 49. fig., 2 refs., 12 equations. **DWB**—TAYLOR's concept of the eddy-free layer has been applied to the phenomenon of dew condensation. The author presents a formula for computing quantity of dew. Also in: *Geophysical Magazine*, Tokyo, 11:91–96, 1937. *Subject Heading:* **1. Dew formation.**

1938

3D–150 551.574.41:581.055 551.586(431/5)

Beruick, Wolf, **Untersuchungen über den Taufall auf der Insel Hiddensee und seine Bedeutung als Pflanzenfaktor.** [Investigation on dew precipitation at Hiddensee Island and its importance as an ecological factor.] *Naturwissenschaftlicher Verein von Neu Vorpommern und Rügen*, Vol. 65–66, **1938.** Unchecked. *Subject Headings:* **1. Dew effects 2. Plant ecology 3. Hiddensee Island, Germany.**

3D–151 551.574.41:656.6

Hahne, W., **Die Grundlagen der Taubildung.** [Basic principles of dew formation.] *Hansa*, Hamburg, 75(14):665–666, April **1938.** **DLC**—Dew frequently forms on the inner walls of ships or on the cargoes themselves, when changeable weather or dew points higher than the temperature of the cargo occurs. This can be serious when steel or preserved foods are taken into the tropics or regions of high humidity. The Canadian Research Committee on Marine Moisture Damage has issued two research papers: (1) "Recommended Terms for Marine Moisture Damage" and 2) "The Principle of Condensation" which can be obtained from the Secretary of the Vancouver Association of Marine Underwriters. *Subject Headings:* **1. Dew formation 2. Shipping 3. Moisture damage 4. Condensation.**—*M. R.*

3D–152 551.508.74

Kyriazopoulos, B., **Drosographe: instrument pour l'étude de la rosée, la gelée blanche, et la pluie.** [Drosometer: instrument for studying dew, hoar frost and rain.] *International Meteorological Organization, Kommission für landwirtschaftliche Meteorologie, Protokolle der Tagung in Salzburg, Sept. 1937, Publication* No. 36:97–100, **1938.** 4 figs. **DWB**—A description of the instrument constructed by the author in Greece. *Subject Heading:* **1. Drosometers.**

3D–153 551.508.74

Molokov, F., **K voprosu izmereniia rosy pri pomoshchi rosomernykh plastinok Leĭka.** [Dew measurement by means of Leick's plates.] *Meteorologiia i Gidrologiia,* 4(9/10):200–202, Sept./Oct. **1938. DLC**—The author considers Leick's method of dew measurement to be incorrect because a measurement cannot give the characteristics of natural conditions. It was observed that amounts of dew measured with old and new plates did not agree. Leick's plates not only collect dew deposits but also absorb moisture from the air. In the author's opinion, the best method of dew measurement is to install a soil monolith among the plants. *Subject Heading:* **1. Drosometers.**

3D–154 551.574.41(4)

*Novák, Václav, **Průběh tvorby rosy v jihomoravském klimatu.** [Process of dew formation in the south Moravian climate.] *Česko-slovenska Akademia Zemědělska, Sbornik,* Prague, 13(3):350–360, Oct. 22, **1938.** 3 figs., 3 tables, 8 refs. German summary p. 360. **NN**—Dew observations were made in Žabacice (southern Moravia) during Aug.–Oct. 1937 by means of Hiltner's drosometer. The drosograms show that dew begins to form 1 to 2 hours before sundown. The maximum amount of dew was usually observed in September from 8–10 p.m.; in August and October, after midnight. The daily maximum of dew reached 0.25 mm, and the mean 0.1–0.2 mm, i.e., 3.6 to 7% of the monthly amount of total precipitation. *Subject Headings:* **1. Dew data 2. Dew intensity 3. Moravia, Czechoslovakia.**

3D–155 551.574.41 551.584(54)

*Ramdas, L. A., **The variation with height of the water vapor content of the air layers near the ground at Poona.** *Bioklimatische Beiblätter der Meteorologischen Zeitschrift,* 5(1):30–34, **1938.** 3 tables, 12 refs. **DWB**—The author gives an account of his study on the variations, with height and time of day, of temperature and humidity in the air layer 0.3 in. to 10 ft above the ground. This study is based on special temperature and humidity observations made at Poona (1933–1937) by means of a small Assmann psychrometer. The observations give very interesting information on the distribution of humidity near the ground and characteristics of conditions of dew formation at various heights above the soil surface. The difference in vapor pressure is, on the average, about 25% of the mean value for the 10 ft layer. In the afternoon, the pressure decreases with height but the relative humidity increases. In the morning, the water vapor content is the least near the ground and increases with height (near 25% for the 10 ft layer); relative humidity increases. Convective winds during such days cause a vertical mixing of the air. Sea breezes, which replace land air, have a higher moisture content. *Subject Headings:* **1. Dew distribution with height 2. Dew data 3. Microclimatology 4. Poona, India.**

3D–156 551.574.41:581.055(09)

†Stephan, Johannes, **Das Tauproblem.** [Problem of dew.] *Bioklimatische Beiblätter der Meteorologischen Zeitschrift,* 5(2):75–81, **1938.** 80 refs. **DWB**—The author notes that the problem of dew is of great importance to the physiology and ecology of plants and to agricultural meteorology. In addition, he gives a comprehensive review of the development of investigations on the problem of dew from Aristotle to 1938. The sources of dew and conditions of dew formation, the methods of observation, measurement techniques and the influence of dew on plants are studied. The bibliography includes the principal works on dew. *Subject Headings:* **1. Dew formation 2. Dew observation 3. Dew effects 4. Plant ecology 5. History of meteorology.**

3D–157 551.574.41:581.055 551.508.74 551.586

Stephan, Johannes and Mildebrath, Ernst, **Registrierende Taumessungen (ein Beitrag zum Tauproblem).** [Self-recording dew measurements (a contribution to the problem of dew).] *Bioklimatische Beiblätter der Meteorologischen Zeitschrift,* 5(1):34–39, **1938.** 5 figs., 16 refs. **DWB**—Accurate measurements of temperature and humidity of the air, evaporation and dew amount are necessary for biological investigations. The majority of the existing drosometers could not give the needed accuracy. The author constructed a new drosometer based on the balance principle in which a special balance pan collects dew. The experimental observations with this drosometer show that dew affects plant growth. *Subject Headings:* **1. Drosometers 2. Dew effects 3. Plant ecology.**

1939

3D–158 551.574.41

Blake, Dean, **Unusual fluctuations in the dew-point along the Southern California coast.** *Monthly Weather Review*, 67(2):39–41, Feb. **1939.** fig., 2 refs. **DWB**—A description of the variations of temperature and dew point in the region of San Diego, California. These microclimatic characteristics give not only temperature and dew point, but can be used for theoretical investigations of the problem of dew formation. *Subject Headings:* **1. Dew point 2. Microclimatology 3. Dew formation 4. San Diego, California.**

3D–159 551.574.41

Engel, Horst, **Das Verhalten der Blätter bei Benetzung mit Wasser.** [Behavior of leaves moistened by water.] *Jahrbücher für Wissenschaftliche Botanik*, Berlin, 88(5):816–861, Dec. **1939.** 7 figs., 24 tables, 16 refs. **DA**—A comprehensive investigation of the content of pH in rain and dew precipitation and their electric conductivity. Dew contains less acid than rain. The maximum content of pH in dew was found to be 3.00 to 7.80 mg pre liter; the mean content 4.6 to 5.6 mg per liter. *Subject Headings:* **1. Dew analysis 2. Electrical properties of dew.**

3D–160 551.508.7

Gol'tsman, M. I., **K rabotam po instrumental'noĭ meteorologii v SSSR za poslednie 20** let. [On the work done on instrumental meteorology in the U.S.S.R. during the last 20 years.] *Meteorologiia i Gidrologiia*, No. 4:104–126, April **1939.** 12 figs., 22 refs. **DLC**—The major works on humidity measurement are listed on p. 109–113 and the author's dew point meters, constructed in 1924 and 1936, are described. *Subject Headings:* **1. Dew point hygrometers 2. Humidity measurement.**

3D–161 551.574.41

Hann, Julius, **Lehrbuch der Meteorologie.** [Textbook of meteorology.] 5th ed. Vol. 1. Leipzig, W. Keller, **1939. DLC**—On p. 375–377, the weather conditions necessary for dew formation are analyzed and a brief review of other works on the temperature and humidity of the air layer near the ground and its variations without dew and under various intensities of dew is given. *Subject Headings:* **1. Dew formation 2. Dew distribution with height.**

3D–162 551.508.74:551.506(431/5)

Kessler, Otto, **Der Tauschreiber Kessler-Fuess.** [Kessler-Fuess dew recorder.] *Bioklimatische Beiblätter der Meteorologischen Zeitschrift*, 6(1):23–26, **1939.** 2 figs., ref. **DWB**—A detailed description of a new drosometer constructed by the author and experimental observations made at Trier. This instrument is the usual Fuess self-recorder with a special plate for collecting dew deposits. *Subject Headings:* **1. Drosometers 2. Dew observation 3. Trier, Germany.**

3D–163 551.574.41:581.055

Knoche, Walter, **Note sobre el rocio.** [A remark on dew.] *Sociedad Científica Argentina, Anales*, Buenos-Aires, No. 127:150–151, **1939.** Review in: *Meteorologische Zeitschrift*, 56(8):322, Aug. **1939. DWB**—The author states that it is important to compare amounts of dew and amounts of other forms of precipitation. In measuring dew, however, there are difficulties arising from its close relation to the physical properties (temperature, color, moisture) of the objects on which it forms and their location, etc. Dew is an important factor in the growth of drought resisting plants. *Subject Headings:* **1. Dew effects 2. Plant ecology.**

3D–164 551.508.74:551.506(495)

*Kyriazopoulos, B., **Une méthode d'enrégistrement de la rosée, la gelée blanche et la pluie.** [Method of recording dew, hoar frost and rain.] *La Météorologie*, 3rd Ser., No. 1:29–38, Jan./Feb. **1939.** 20 figs., 2 tables, 17 refs. **DWB**—The author constructed and tested in Athens a drosometer with which rain, hoar frost and dew can be measured by means of the distinctive trace left by each on glossy, smoked paper exposed to the sky. This instrument proved to be superior by registering more nights with dew than was observed at stations without this equipment. *Subject Headings:* **1. Drosometers 2. Dew observation 3. Athens, Greece.**

3D–165 551.574.41

Martin, Edward A., **Dew.** (In: **Encyclopedia Americana. 1939.** Vol. 9. p. 44–45). **DLC**—Dew is defined as a moisture deposit observed after sunset on the surface of the earth. The sources of dew are: moisture in the atmosphere, water vapor arising from the soil and the moisture exhaled by plants. Dew is deposited as hoar frost when the temperature of the air near the ground is below 32°F. Heavy dew is observed in tropical regions. *Subject Heading:* **1. Dew sources.**

3D–166 551.508.74 551.574.41

†*Mrose, Helmut E., **Ein volumenometrisches Taumessgerät.** [Volumetric drosometer.] *Zeitschrift für angewandte Meteorologie*, 56(5):137–149, May **1939.** 3 figs., 2 tables, 9 refs. **DWB** — The author indicates the difficulties in measuring dew. A brief summary of the methods used earlier and the results obtained by Wollny (1892), Kerner (1892), Houdaille (1893), Andrianov (1927), Visser (1929) and others are presented and discussed. A description of a new type of drosometer and a summary of observations made during 1937–1938 with this instrument are given and analyzed. *Subject Headings:* **1. Drosometers 2. Dew measurement techniques 3. Dew intensity.**

3D–167 551.574.41(47)

Truss, P. S., **K voprosu ob issledovanii khimicheskogo sostava atmosfernykh osadkov.** [Investigation of the chemical composition of atmospheric precipitation.] *Meteorologiia i Gidrologiia*, No. 10/11:197–202, Oct./Nov. **1939.** 10 tables, 3 refs. **DLC**—The chemical composition of rain, snow and dew was analyzed at the Meteorological Observatory of the Timiriazev Agricultural Academy (near Moscow) in March–Oct. 1925. The content of NH_4, NO_3, NO_2 and P_2O_5 was determined. Results are shown in numerous tables. *Subject Headings:* **1. Dew analysis 2. Precipitation analysis 3. Moscow, U.S.S.R.**

3D–168 551.574

Tugarinov, V., **Kondensatsiia vodianykh porov vozdukha.** [Condensation of atmospheric water vapor.] *Meteorologiia i Gidrologiia*, No. 9:129–131, Sept. **1939.** 3 tables, 3 refs. **DLC**—Report of observations and work done at an experimental condensation plant near Moscow. During the period May 18 to August 6, 1938, 5227 cm^3 of moisture were collected. *Subject Headings:* **1. Condensation 2. Artificial condensation plants 3. Moscow, U.S.S.R.**

1941

3D–169 551.574.4

Lampadius, G., **Nebelfrostablagerungen sowie Tau- und Nebelniederschlag.** [Rime deposits, dew and fog precipitation.] *Tharandter Forstliches Jahrbuch*, Berlin, 92(9/10):545–584, **1941.** 6 figs., 6 tables, 28 refs. **DLC**—A comprehensive study of the problems of dew, hoar frost and rime formation. Temperature, relative humidity, winds and weather conditions are analyzed. The author deals at length with the formation of fog and rime. Brief description of methods of measurement of dew amount and remarks on the conditions of fog precipitation in mountain regions complete this interesting investigation. *Subject Headings:* **1. Dew formation 2. Hoar frost 3. Rime.**

3D–170 551.574.41

Rosa. [Dew.] (In: **Bol'shaia Sovetskaia Entsiklopediia. 1941.** Vol. 49. p. 166.) **DLC**—Dew is defined as being the precipitation of water vapor which arises from the soil and forms by radiational cooling after sunset on horizontal surfaces. The average amount of dew per night is 0.1 to 0.3 mm; in moist, tropical climates it is larger. *Subject Headings:* **1. Dew sources 2. Dew intensity 3. Dew formation.**

3D–171 551.574.41

Whipple, Francis John Welsh, **The persistence of dew.** *Royal Meteorological Society, Quarterly Journal*, 67(290):152, April **1941.** table. **DLC**—Brief report on dew and hoar frost observations made at Kew Observatory in 1940. The frequency of dew and hoar frost is given in a table. *Subject Headings:* **1. Dew observation 2. Hoar frost observation 3. Kew, England.**

1942

3D–172 551.574.41:632 551.586

De Fina, Armando Leopoldo, **El valor agricola del rocio.** [Agricultural value of dew.] *Revista Meteorológica*, Montevideo, 1(3):19–24, July **1942.** 11 refs. **DLC**—Brief description of conditions under which dew forms and of methods of measuring dew deposits. Insignificant annual amount of dew has no effect on the growth of plants; but, this amount is sufficient for the development of various plant diseases which cause trouble for farmers. *Subject Headings:* **1. Dew formation 2. Drosometers 3. Plant diseases 4. Agricultural meteorology.**

3D–173 551.574.41:63

Lehmann, Paul and Shanderl, Hugo, **Tau und Reif; Pflanzenwetterkundliche Untersuchungen.** [Dew and frost; agro-meteorological investigations.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 9(4), **1942.** 20 p. 8 figs., tables, 17 refs. **DLC**—A dissertation on the formation and evaporation of dew and frost, including a detailed discussion of instruments for measuring dew and moisture (lysimeters, dew recorders, etc.); and botanical considerations such as transpiration, use of dew by plants, the effect of artificial factors such as wind breaks (trees, hedges,

fences, etc.), irrigation, fertilizer, root systems, various leaf surfaces, etc., on dew formation or evaporation, as well as the variation in meteorological elements such as radiation, temperature, humidity and wind. (*Same abstract* as No. 8-84 in Aug. 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Dew 2. Hoar frost 3. Lysimeters 4. Drosometers 5. Agricultural meteorology.**—*M.R.*

3D–174 551.584.44

Mäde, Alfred, **Die Agrarmeteorologie in der Pflanzenzüchtung.** [Agro-meteorology in plant cultivation.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 9(6), **1942.** 47 p. 35 figs., 11 tables, 14 refs., append. **DWB**—A microclimatic study made at the Agricultural Meteorological Station in Müncheberg for the purpose of investigating the distribution of temperature and relative humidity in the air layer near the ground. The dependence of these elements upon vegetation and weather conditions is shown in numerous tables. *Subject Headings:* **1. Microclimatology 2. Temperature distribution 3. Humidity distribution 4. Müncheberg, Germany.**

3D–175 551.508.711

Middleton, William Edgar Knowles, **The early history of hygrometry, and the controversy between de Saussure and de Luc.** *Royal Meteorological Society, Quarterly Journal*, 68(297):247–261, Oct. **1942.** 8 figs., table, 44 refs. **DLC**—An exhaustive report read before the Royal Meteorological Society in London on June 17, 1942, and before the Canadian Branch of the Society of Toronto, Jan. 23, 1942 supplemented with an interesting discussion (p. 259–261). The author presents the development of hygrometry from the time of LEONARDO DA VINCI up to about 1800. *Subject Headings:* **1. Hygrometry 2. History of meteorology.**

3D–176 551.574.41

Whipple, Francis John Welsh, **The persistence of dew.** *Royal Meteorological Society, Quarterly Journal*, 68(297):278, Oct. **1942.** table. **DLC**—This is the second report on special dew observations made at Kew Observatory during 1941. For a period of 12 months, dew observations were made 86 times at 7 a.m. Dew disappeared before 7 a.m. twelve times. The frequency of dew and hoar frost is presented in a table. *Subject Headings:* **1. Dew frequency 2. Hoar frost 3. Kew, England.**

1943

3D–177 551.574.41

Archbold, J. W., **Preliminary note on condensation in the form of clouds and dew.** *Philosophical Magazine*, London, 7th Ser., 34(236):632–642, Sept. **1943.** 10 figs., 37 equations. **DLC**—In the last part of this paper (p. 641–642), the sizes of dew drops are shown to follow a law similar to that applying to cloud drops. *Subject Heading:* **1. Dew drop size distribution.**

3D–178 551.574.41

*Drummond, A. J., **The persistence of dew.** *Royal Meteorological Society, Quarterly Journal*, 69(301):234–235, July **1943.** 2 tables, 2 refs. **DLC**—A report, similar to reports of previous years, on observations made at Kew Observatory during 1942. The author gives a brief analysis of conditions under which dew and hoar frost form. *Subject Headings:* **1. Dew data 2. Hoar frost 3. Kew, England.**

3D–179 551.508.7

Middleton, William Edgar Knowles, **Meteorological instruments.** 2nd ed. rev. Toronto, University Press, **1943.** 227 p. 169 figs., tables, numerous refs. **DLC**—In Chap. 4, Sec. 5 (p. 106–108, 3 figs., 4 refs.) entitled "Dew point hygrometer," brief descriptions of the various instruments used for direct determination of the dew point, by observing dew which forms when a polished metal surface (nickel or silver) is cooled, are given. *Subject Heading:* **1. Dew point hygrometers.**

3D–180 551.574.41:63: 551.586

†Stephan, Johannes, **Zum Tauproblem.** [On the dew problem.] *Biologia Generalis*, Vienna, 7(1/2):204–229, **1943.** table, 123 refs. **DLC**—A comprehensive review of nearly all important research on the relation of dew to plant growth and disease carried out in every country during the past 100 years. Formation and measurement of dew and the effect of dew on soil moisture are also treated. (*Same abstract* as No. 8–85 in Aug. 1950 *Meteorological Abstracts.*) *Subject Headings:* **1. Dew effects 2. Bioclimatology 3. Agricultural meteorology 4. Plant ecology.** *M.R.*

1944

3D–181 551.574.4

Drummond, A. J., **The persistence of dew.** *Royal Meteorological Society, Quarterly Journal*, 70(303):90–91, Jan. **1944.** table. **DLC**—A note on dew and hoar frost observations made at Kew

Observatory during 1943. This year was noted for dew, and dew was registered 115 times at 7 a.m. G. M. T., dew was observed 41 times at 11 a.m. G. M. T. and 21 times at 1 p.m. *Subject Headings:* **1. Dew observation 2. Hoar frost 3. Kew, England.**

3D–182 551.574.41:551.524.3

Seeman, J. and Löw, K., **Die Auswirkung der Taubildung auf den Temperaturverlauf in der bodennahen Luftschicht.** [Effect of dew formation on temperature variations of the air layer near the ground.] *Meteorologische Zeitschrift*, 61(5):158–161, May **1944.** 4 figs., 7 refs. **DWB**—Temperature variations in relation to humidity in the first 200 cm above the surface are presented in diagrams. The author establishes the following sequence in the process: cooling of the surface on which dew will form; formation of dew; warming of the air layer near the surface and a decrease of relative humidity; equalizing of temperature near the ground and the beginning of a new process of dew formation. *Subject Headings:* **1. Dew formation 2. Temperature variations.**

1945

3D–183 551.574.41

Archbold, J. W., **Second note on condensation in the form of clouds and dew.** *Philosophical Magazine*, London, 7th Ser., 36(257):414–418, June **1945.** table, equation. **DLC**—A continuation of the note under a similar title (*see item* 3D–143 above). The author emphasizes the electrical charge caused by condensation processes. *Subject Headings:* **1. Condensation 2. Dew formation 3. Electrical properties of dew.**

3D–184 551.574.4

Drummond, A. J., **The persistence of dew.** *Royal Meteorological Society, Quarterly Journal*, 71(309/310):415–417, July/Oct. **1945.** 2 tables. **DLC**—A summary of the observations made at Kew Observatory on the persistence of dew and hoar frost during 1940–1944. Five-year means of dew and hoar frost frequency along with means for 1944 are given in tables. Dew remains longest in October and occurs most frequently in September (from 24 days in 1940 to 15 in 1943). The greatest frequencies of hoar frost occur in March. The minimum of days with dew was observed in February and March. Five-year means gave 104 days for dew and 45 days for hoar frost. *Subject Headings:* **1. Dew frequency 2. Hoar frost 3. Kew, England.**

3D–185 551.574.41:551.508.74(47)

*Nebol'sin, S. J., **Rosa (metody izucheniia, rezul'taty nabliudenii).** [Dew (methods of study, results of observations).] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. i Geofiz.*, 9(5/6):461 476, **1945.** 5 figs., 7 tables, 9 refs. English summary p. 476. **DLC**—This study contains results of experimental measurements of dew amount by various methods. These observations were made at the Sobakino Agricultural and Meteorological Station near Moscow during 1938–1940 and showed that the drosometers of LEICK, VISSER and KYRIAGOPOULOS can be used for dew measurements. Methods based on observations of the change of the specific humidity of air during the night are more objective. The drosometer observations indicate that the number of days with dew is much greater than can be established by visual observations. In Central Russia dew can be observed nearly every night during the summer. The author also analyzes the influence of meteorological and topographical factors on dew formation. Special investigations made at Sobakino and in the Leningrad region prove that more dew occurs in open areas and near rivers; it does not form on grass and under trees. *Subject Headings:* **1. Dew observation 2. Drosometers 3. Dew frequency 4. Sobakino, U.S.S.R. 5. Leningrad, U.S.S.R.**

1946

3D–186 551.574.41:632

Duvdevani, Shemuel; Reichert, J. and Palti, J., **The development of downy and powdery mildew of cucumber as related to dew and other environmental factors.** *Palestine Journal of Botany and Horticultural Science, Rehovat Ser.*, 5(2):127–151, **1946.** **DA**—Preventing dew formation by covering experimental plots with canvas canopies shows that powdery mildew of cucumbers (Erysiphe cichoracearum) is not affected by dew. But preventing dew formation does keep downy mildew from developing. *Subject Headings:* **1. Dew effects 2. Plant diseases 3. Dew observation 3. Palestine.**

1947

3D–187 551.508.74

Duvdevani, Shemuel, **An optical method of dew estimation.** *Royal Meteorological Society, Quarterly Journal*, 73:282–296, Oct. **1947.** 7 figs., 2 tables, refs. Reviews in: *Nature*, London, 159(4041):515, April 12, **1947**; *Meteorological Magazine*, London, 76(901):160–161, July **1947**, and *Weather*, 11(7):215, July **1947.** **DWB**—A new, optical method of dew estimation is described in which appearance of dew on a wooden block is compared with a series of standard photographs of

dew. Its merits relative to the older direct weighing method are evaluated. Particular advantages of the proposed method are: validity of measurement is undisturbed by evaporation and rain, dew on plant leaves can be measured, and simplicity qualifies optical measurement for field use. Personal errors appear unimportant as they tend to balance out in monthly averages. Fading and peeling of paint on the wooden block are cited as weaknesses of the method. A discussion at the end includes questions by four critics and replies by the author. *Subject Headings:* **1. Drosometers 2. Dew data 3. Palestine.**—*M.P.K.*

3D–188 551.574.41

Gerson, N. C., **Super-cooled water, (drops at the earth's surface).** *American Meteorological Society, Bulletin*, 28(9):421–422, Nov. **1947.** table. **MH-BH**—On the basis of observations made at Gimli Airport, Manitoba, Canada, the author remarks that dew near the freezing point first condenses and then slowly becomes supercooled. A Dakota type aircraft was covered with canvas in order to prevent the formation of ice. The air temperature during the night was 34–31°F. The following morning the author observed that dew had formed (some of it as tiny puddles of water gathered in depressions of the canvas). When the canvas was disturbed, the water instantly froze into clear ice. *Subject Headings:* **1. Dew formation 2. Manitoba.**

1948

3D–189 551.506:551.571

*Boughner, C. C. and Thomas, M. K., **Climatic summaries for selected meteorological stations in Canada, Newfoundland and Labrador. Vol. II. Humidity, wind speed and direction.** Canada, Dept. of Transport, Meteorological Div., May **1948. MH-BH**—On p. 19–24, average values of relative humidity and dew point temperature with corresponding values of air temperatures and mixing ratio at four fixed hours (0130, 0730, 1330 and 1930) for the period May 1940 to December 1945 are given. *Subject Headings:* **1. Dew point 2. Canada 3. Newfoundland 4. Laborador.**

3D–190 551.574.4:016

†Knoch, Karl and Blüthgen, J., **Klimatologie und Meteorologie (1929–1938). VII. Wasserdampf und Hydrometeore.** [Climatology and meteorology (1929–1938). VII. Water vapor and hydrometeors.] *Geographisches Jahrbuch*, Gotha, 59(1):1–73, **1948.** 147 refs. **MH-BH**—This bibliography presents a complete list and a brief review of the majority of scientific works for the period 1929–1938. On p. 19–20 special references to dew and hoar frost are given. *Subject Headings:* **1. Dew 2. Bibliographies.**

3D–191 551.574.41:551.506.34

†*Masson, H., **Condensations atmosphérique non enregistrables en pluviomètre. L'eau de condensation et la végétation.** [Atmospheric condensation not recordable by rain gages. Condensation water and vegetation.] *Institut Francais d'Afrique Noire, Bulletin*, 10:1–182, **1948.** 49 figs., tables, 85 refs. **NNA**—A study on condensation processes and the influence of different meteorological factors on dew formation and its intensity. This investigation also contains a detailed description of many methods used for dew measurement and data of long period observations of dew in North Africa. Comparative summary of dew measurements (mean monthly data) for many points of Africa, Europe and Asia and good references conclude this work. *Subject Headings:* **1. Dew formation 2. Dew data 3. Long period records 4. Africa 5. Europe 6. Asia.**

3D–192 551.582(495)

*Philippson, Alfred, **Das Klima Griechenlands.** [The climate of Greece.] Bonn, Ferd. Dümmler, **1948.** 238 p. 6 charts, tables, 99 refs. **DWB, MH-BH**—A comprehensive, analytical study of the climate of Greece and neighboring islands, consisting mainly of a review of the material taken from a large number of sources. Among the subjects discussed is "Water in the Atmosphere" including: water vapor, cloudiness, turbidity, rainfall, rainy days, intensity, yearly variations, thunderstorms, hail, snow, snow cover and dew. Tabular data are arranged and discussed by elements and by regions. (*Same item* as No. 2E–200 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **1. Dew observation 2. Annual dew variations 3. Greece.**—*M.R.*

3D–193 551.508.71

Puck, Theodore T., **An automatic dew point meter for the determination of condensable vapors.** *Review of Scientific Instruments*, 19(1):16–23, Jan. **1948.** 5 figs., table, 15 refs., 5 equations. **DWB**—A detailed description of the construction, calibration and use of a dew point meter. This meter is based on measurement of the decrease of reflecting properties of a cooled plate. The method is good for determining small concentrations of water vapor. *Subject Headings:* **1. Dew point hygrometers 2. Dew point observation.**

1949

3D–194 551.574.41 551.582:551.506.1(569.4)

*Ashbel, Dov. **The climate of Palestine and adjacent countries during the year 5708 (1947–48).** *Tel-Aviv, Hassadeh Library, Annual Report*, 28th Year. **1949.** 32 p. extensive tables. 1932–1937, 1944–1945, 1946–1947 at **MH-BH**—Reports appear in Hebrew but consist mainly of tables with English translations of titles. This report is the latest in a series of reports on the climate of Palestine. First pamphlet includes tabulated data for 1933–34. Early report includes as subtitle: "Table of rainfall in the Upper Euphrates, Syria, Lebanon, Palestine, the Sinai Peninsula and Lower Egypt during the winter 5694 (1933–34)." Later issues cover rainfall, temperature, relative humidity, number of dew nights, evaporation, and wet bulb temperature, all recorded in detail. (*Same abstract* as No. 2E–202 in May 1951 *Meteorological Abstracts*.) *Subject Headings:* **1. Dew observation 2. Palestine.**—*H.P.K*

3D–195 551.574.41

Uhlig, Siegfried. **Der Tau.** [Dew.] *Naturwissenschaftliche Rundschau*, Stuttgart, 2(10):468–469, Oct. **1949.** **DWB**—A brief survey of conditions observed during dew formation at various latitudes of the earth. *Subject Heading:* **1. Dew.**

1950

3D–196 551.508.71

Conover, John H., **Tests and adaptation of the Foxboro dewpoint recorder for weather observatory use.** *American Meteorological Society, Bulletin*, 31(1):13–22, Jan. **1950.** 9 figs., 2 tables, 12 refs. **DWB, MH-BH**—Description of various types of dew point recorders. The Foxboro "Dewcel," used in air conditioning was selected for tests at Blue Hill. Construction, operation, calibration, shielding, time lag, scale comparisons, etc., described and amply illustrated by reproduction of charts, calibration curves, schematic diagrams and photographs of equipment and installations. Comparison of three types of instruments shows that this lithium chloride type cell with the "Dewcel" recorder has many advantages: 1) less expensive, 2) needs attention only once in three months, 3) instrument is rugged, 4) accurate to +2°F. and 5) considerable lag resulting in stability of readings. It is, however, inaccurate at very low humidities. (*Same abstract* as No. 4–21 in April 1950 *Meteorological Abstracts*.) *Subject Headings:* **1. Dew point recorders 2. Hygrometers.**—*M.R.*

3D–197 551.584 551.574.41

†*Geiger, Rudolf. **The climate near the ground.** Cambridge, Mass., Harvard University Press, **1950.** 482 p. numerous figs., tables, refs. **MH-BH**—In this comprehensive microclimatic study, the author presents an analysis of dew as a microclimatic problem. References on dew and an index of subjects are presented on p. 447–448 and 473–482, respectively. (*See item* 2.1–158 in Jan. 1951 *Meteorological Abstracts* for a more complete abstract.) *Subject Headings:* **1. Microclimatology 2. Dew formation.**—*M.R.*

3D–198 551.574.41(569.4)

*Shalem, Nathan, **La rosée en Palestine.** [Dew formation in Palestine.] *La Météorologie*, 4th Ser., No. 19:182–186, July/Sept. **1950.** 3 figs., fold. table. French, English and Spanish summaries p. 182. **DWB**—Dew is as important as rain in the agriculture of Palestine and the Levant since dew occurs most frequently in the dry season. Factors which control dew formation are discussed. Regional distribution of amount and frequency of dew in Palestine, Transjordan, etc., is given by months, seasons and for the year. October is the month with minimum amount and number of days with dew throughout the area and late spring the time of maximum, as a rule. (*Same abstract* as Nos. 2.5–132 and 2E–210 in May 1951 *Meteorological Abstracts*.) *Subject Headings:* **1. Dew formation 2. Dew variations 3. Palestine.**—*M.R.*

1951

3D–199 551.506.3:551.574.41(43)

*Antonik, Bertold, **Die Häufigkeit des Vorkommens von Tau und Reif nach den Potsdamer Beobachtungen.** [Frequency of occurrence of dew and rime from observations at Potsdam.] *Zeitschrift für Meteorologie*, 5(2):52–55, Feb. **1951.** 6 tables, 3 refs. **MH-BH**—Mean frequency of dew during 1936–1948 was 140 days (Jan. 7–Sept. 22), rime 1901–1948 was 45 days. Causes and definitions discussed; special cases are frozen dew and "fog-dew." (*Same abstract* as No. 2.5–131 in May 1951 *Meteorological Abstracts*.) *Subject Headings:* **1. Dew data 2. Potsdam, Germany.**—*C.E.P.B.*

3D–200 551.574.41

Arai, T., **Studies on the dew. 1. Some observations on the formation of dew. 2. The dew traces on sooted papers.** *Journal of Agricultural Meteorology*, Tokyo, 7(1):21–26, Dec. **1951.** 4 figs., 2 tables, 15 refs., equations. English summary p. 23, 26. **DWB**—Observations of dew formation on a cooled glass surface under varying conditions are reported in Pt. 1. Quantitative conclusions were reached regarding dew forming on glass warmer than the surrounding air, glass confined within a small box and glass plates placed near a water vessel, with or without air current. Pt. 2 is an account of dew formation studies made with various kinds of sooted paper exposed to open air at night. Author reports some instances of dew drops growing to a size of 1 cm in diameter and attributes this phenomenon to the capillary action of paper. *Subject Headings:* **1. Dew formation 2. Dew observation.**—*G.T.*

3D–201 551.508.71

Barrett, Earl W. and Herndon, Lee R., Jr., **An improved electronic dew-point hygrometer.** *Journal of Meteorology*, 8(1):40–51, Feb. **1951.** 8 figs., table, 6 refs., 23 equations. **MH-BH** The basic physical theory of dew point hygrometry is discussed. The operating principles and design of an electronic dew point hygrometer, which is an improvement over the Thornthwaite-Owens apparatus, are described and illustrated with photographs and diagrams. The apparatus utilizes "the photoelectric detection of condensation on a cooled, polished metal mirror combined with a radio-frequency induction heating system and an all-electronic proportional heat control servo system." Continuous automatic measurement of atmospheric water vapor can be made in laboratory and field under diverse temperature conditions with high accuracy and slight lag. (*Same abstract* as No. 2.7–41 in July 1951 *Meteorological Abstracts*.) *Subject Heading:* **1. Dew point recorders.**—*I.L.D.*

3D–202 551.574.41:551.506.1(569.4)

*Israel. Meteorological Service, **Annual dew summary, 1945–1950 —.** Hakirya, **1946–1951–** . 5 pieces, paging varies, chiefly tables. Hebrew and English. **DWB** Originally the reports were issued at Jerusalem by the Palestine Meteorological Service. They contain monthly and annual amounts of dew in milimeters and number of days with dew for many stations in coastal, hilly and rift valley regions of Palestine. The observations, according to DUVDEVANI's method, were made on a standard surface at 1 m above the ground. The most dew was observed in coastal regions and the least in rift valleys. *Subject Headings:* **1. Dew observation 2. Annual dew variations 3. Annual reports 4. Palestine.**

3D–203 551.509.53

Mollwo, Hans, **Temperaturminimum und Taupunkt.** [Temperature minimum and dew point.] *Meteorologische Rundschau*, 4(9/10):175–178, Sept.–Oct. **1951.** 3 figs., 2 tables, 2 refs. **MH-BH** From hourly data at Frankfurt a. M. on fog-free, cloudless nights, author examines relations between maximum temperature, daily range and dew point in each month, and obtains a diagram and table showing cooling to be expected, given midday temperature and date. Forecasting night frosts is briefly discussed. (*Same abstract* as No. 3.4–83 in April 1952 *Meteorological Abstracts*.) *Subject Headings:* **1. Frost forecasting 2. Temperature forecasting.**—*C.E.P.B.*

1952

3D–204 551.574.4

Würfel, Heinz, **Die Häufigkeit des Auftretens von Tau und Reif in Eisleben.** [Frequency of occurrence of dew and rime in Eisleben.] *Angewandte Meteorologie*, 1(4):119–120, Jan. **1952.** **DWB** In comparison with B. ANTONIK (*see item* No. 2.5–131 in May 1951 *Meteorological Abstracts*) on Potsdam, 10-year mean monthly frequencies of dew and rime at Eisleben [51°32'N. 11°33'E.] are tabulated and 5-day graphs shown. *Subject Headings:* **1. Dew 2. Rime 3. Eisleben, Germany.**—*C.E.P.B.*

SUPPLEMENTARY MATERIAL

3D–205 551.574.41

Ashbel, Dov, **Bio-climatic atlas of Israel.** Jerusalem, Meteorological Dept. of the Hebrew University, **1950.** 151 p. 315 figs. In English and Hebrew. **DWB** In the chapter on dew (p. 51–55) the author presents original isopleth charts of annual seasonal frequency of dew and annual quantity of dew measured (in mm) in various parts of Palestine, showing extreme variability from place to place. Sample thermograph and hygrograph traces for a summer and a winter week when heavy dew formed, show relation of temperature and humidity to time of fog or dew formation, respectively. Nights are classified according to time of dew formation. (*Same item* as 2E–208, in *Meteorological Abstracts*, May 1951.) *Subject Headings:* **1. Dew frequency 2. Dew formation 3. Atlases 4. Israel.**—*M.R.*

3D–206 551.508.74

Duvdevani dew gauge. London, C. F. Casella & Co. Ltd., March **1952.** Its Leaflet 772. 8 p. figs. **DWB**—The theoretical and technical difficulties encountered in measuring dew deposits are presented and the advantage of the method and gage of Duvdevani are pointed out. The gage consists of specially treated wood and the paint is applied to it in such a way that the dew collects in frequencies of sizes and forms characteristic of the amount of dew fall. The characteristic dew distributions are photographed and reproduced in natural size. A table of equivalents in dew millimeters makes it possible to record the amount of dew fall and the deposit found on the dew gage is matched to the photographs. A detailed description including a photograph of the apparatus and of its operation is given. *Subject Headings:* **1. Dew measurement 2. Duvdevani dew gage.**—*I.L.D.*

3D–207 551.574.4:63

Steubing, Lore. **Der Einfluss von Heckenanlagen auf den Taufall.** [Influence of hedges upon deposition of dew.] *Germany, Deutscher Wetterdienst in der US-Zone, Berichte,* No. 32:53–56, **1951.** 7 figs., 3 tables. **DWB**—More dew, less evaporation and larger crop yield is observed in regions with hedges. The most favorable direction of the hedges is across the prevailing wind direction. Dew profiles behind hedges are given. *Subject Headings:* **1. Agricultural meteorology 2. Dew 3. Windbreaks.**—*A.A.*

3D–208 551.574

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PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section are for information only, and will not be listed in either the author or subject indexes. When material is furnished in advance of date of publication, the pagination may be omitted.

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